

Machine and Tool **BLUE BOOK**

A DIGEST OF THE METAL WORKING INDUSTRY

OCTOBER, 1948

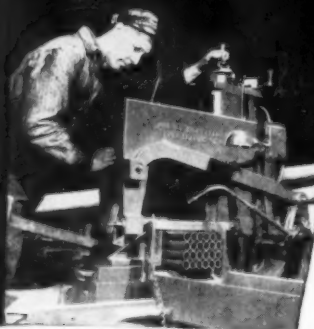
THIS MONTH

Tooling at Bush Mfg. Co.
Electronic Lathe Controls
Versatility of Carbides
Who Influences Machine Tool Purchases
NMTBA Sales Refresher Course
What's New in Metalworking
Available Literature
Advertisers' Products Index
Index to Advertisers

COMPLETE INDEX ON PAGE 5

A HITCHCOCK PUBLICATION

MARVEL Saws Speed-Up Deliveries



Steel warehouses and stockrooms deliver cut-off lengths in any quantity FASTER—BETTER—CHEAPER when equipped with MARVEL 6A and 9A Automatic Hack Saws. Far faster, floor to floor, than any other hack saws, they save valuable machine hours by reducing cutting-off time to a fraction—save other machining hours by producing accurately cut pieces of exact length.

There is a MARVEL Saw for every need—in every capacity range and price class. Your local MARVEL Sawing Engineer will gladly study your metal sawing problems and requirements and make recommendations as to methods and equipment.

Business for Distribution

Circle 100
Sawing and Metal
Cutting Equipment
Sawing and Metal
Cutting Equipment

Armstrong-Blum Mfg. Co.,
5700 West Bloomingdale Avenue
Chicago 39, Illinois

Gentlemen:

In a short time we expect to place an order with you for another No. 9A Marvel Automatic Hack Saw. This is in addition to the two machines we now have.

Our present Marvel Automatic Hack Saws are giving us very satisfactory service, enabling us to speed cutting of mechanical and boiler tubes to our customers' required lengths at a minimum of cost, both for labor and blades.

Your service and attention to our requirements have been very satisfactory.

Sincerely,

TUBE DISTRIBUTORS CO., INC.

A. J. Lewis

Superintendent

AFL:CD



MARVEL SAWS

Metal Cutting

Better Machines—Better Blades



A.C. or

D.C.



Either HOBART WELDER will cut production costs for you

You get top quality welds at high production speeds which insures lower costs, more profits.

Highest Efficiency

New standards of performance have been established with controls which regulate the flow of current at or away from the welder. Savings result in smooth, continuous operation.

Better Products

A new quality of work, never before thought possible, is now obtained

with the Hobart simplified, easy welding process.

Greater Utility

The ability to handle a wide range of work makes these new Hobart welders more versatile than ever before.

A Model for Any Need

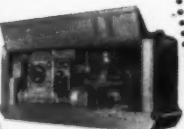
Whether you prefer A-C or D-C welding, you will find you can do better with Hobart.

HOBART BROS. CO., Box TB-108 Troy, O.

Gas Drive A-C Arc Welder and A-C Power Unit

Gas Drive D-C Arc Welder

Ask for complete Catalog



5. Gas Drive D-C Arc Welder with Auxiliary D-C Power



6. "Weldmobile" Self-Propelled Arc Welder



7. Gas Drive D-C Arc Welder with Auxiliary A-C Power

It's Better to buy a HOBART than to wish you had.

HOBART

"One of the World's largest builders of arc welders"



HOBART ELECTRODES

Try the new Hobart No. 13 Electrode for light gauge welding. They're faster

..... paste to post card and mail today!..

HOBART BROS. CO., Box TB-108 Troy, O. Please give me complete information on the machines I've checked.

Check machine here ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7
Send ☐ Complete Catalog ☐ Vest Pocket Guide ☐ Electrode Catalog.

free

Vest Pocket Guide for all welders

NAME _____

FIRM _____

ADDRESS _____

Cut "set-up" time Slash toolroom grinding costs



with the New RIVETT 1024 TOOLROOM GRINDER

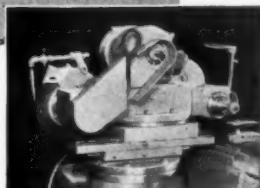
At long last! — a toolroom grinder that *does* something about "set-up" costs, far and away the most expensive item in toolroom and small lot grinding. On internal and external grinding work on straight, taper, two-angle, face and shoulder surfaces, Rivett 1024 has these *new* features to help you cut "set-up" time drastically:

1. **Double-end wheelhead** — Exclusive! Two spindles on swiveling workhead make possible rapid changes to internal or to external work. 2. **Hydraulic table reciprocation** — infinitely adjustable for speed and length of travel. 3. **Graduated swivel table and sine bar on workhead** — assure accurately measured tapers and angles. 4. **Optional work holding methods** — uses collets, step chucks, jaw chucks, plates, fixtures or "on-centers." 5. **Adjustable spindle speed** — internal from 6,000 to 35,000 r.p.m.; external 1800 or 2100 r.p.m.

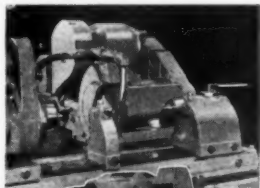
And that's not all — the Rivett 1024 Grinder has been specially designed to extend the *range* of your grinding operations . . . double slides and swivels on cross slide increase possible "set-ups" including double angles at one grind . . . external wheel can be mounted on either end of spindle to permit face and shoulder grinding using periphery of wheel . . . positive table stop with micrometer adjustment positions work.

CUT COSTS ON TOOLROOM GRINDING

Bulletin 1024 tells the whole story in pictures and helpful technical information. Write for your copy today.



New! Double-end wheelhead carries both internal and external spindles . . . swivels 180° to position either spindle. Found only on the new Rivett 1024!



RIVETT

RIVETT LATHE & GRINDER, INC.

BRIGHTON • BOSTON • MASSACHUSETTS • U. S. A.



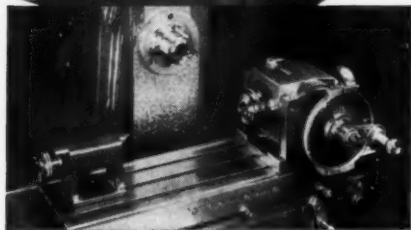
HARDINGE
ELMIRA, N.Y.

HIGH SPEED PRECISION MILLING MACHINE

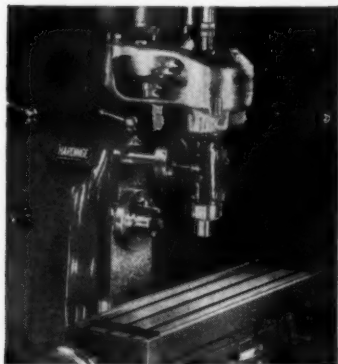
FOR
TOOL ROOM AND LABORATORY

Tool room and laboratory work, because of the variety, demands useful milling machine attachments. Hardinge knows this. Illustrated are two attachments in addition to the arbor and vise shown below. Other attachments are: Power feed for table; oil coolant facilities; 360° swivel base, also right angle base for dividing head; taper hole collets, as well as regular collets; step chucks and jaw chucks for dividing head.

Write for
Bulletin
TM-UM



Modern design universal plain dividing head and tailstock. Designed to match the precision qualities of the machine. Features are: Preloaded ball bearing spindle; takes standard 1" capacity collets same as used in horizontal spindle; and high speed indexing, 4 to 1 ratio.



This attachment provides high speed vertical milling. Has separate motor driven preloaded ball bearing spindle — eight selective speeds from 465 to 4250 r.p.m.—takes standard 1/2" capacity collets. Vertical head swivels to angular settings.

HARDINGE BROTHERS, INC., ELMIRA, N. Y.

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ARMSTRONG TOOL HOLDERS



- answer both . . .
1. The problem of lower-
ing costs
 2. The problem of increas-
ing output

By providing permanent, multi-purpose, inexpensive ARMSTRONG TOOL HOLDERS that use cutters or bits that are quickly ground from standard high speed shapes (Saving: All Forging, 70% Grinding and 90% High Speed Steel), the Armstrong System of Tool Holders will reduce your tool cost to an absolute minimum.

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There is no surer way to lower costs and increase output, than to use the correct ARMSTRONG TOOL HOLDER for each operation on all machines.

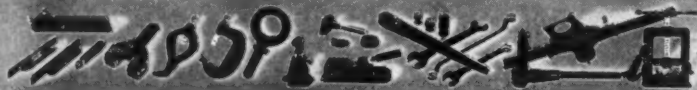
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"The Tool Holder People"

5208 W. Armstrong Ave.

Chicago 30, U.S.A.

Eastern Warehouse and Sales: 199 Lafayette St., N. Y. 12, N. Y.
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OCTOBER, 1948

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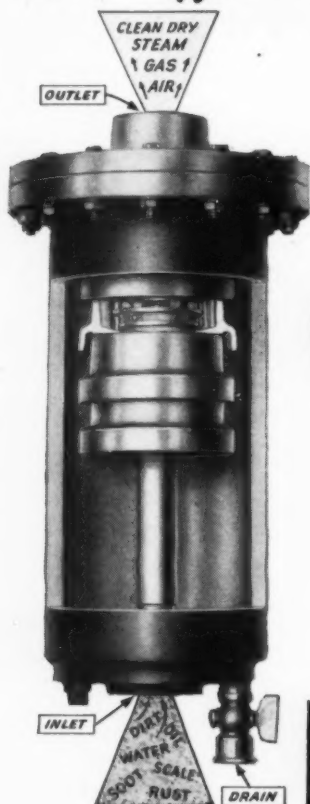
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by this *Exclusive Method*

No MOVING PARTS
No FILTERS TO REPLACE
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AIR SEPARATORS**

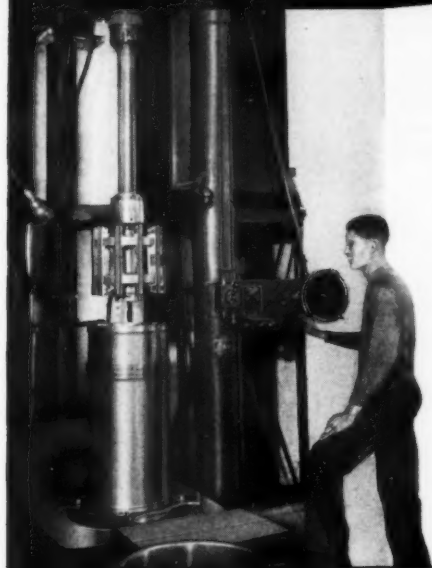
The accurately rated capacities of CMD Textite Air Separators assure ample C.F.M. volume to clean air and thoroughly dry it. Not mainliners; should be installed at or near point of use. Four sizes from 25 C.F.M. to 250 C.F.M. inclusive. Write for bulletins and complete technical data.

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& DISTRIBUTING CO.**

Dept. 28B, 1928 W. 46th St., Chicago 9, Ill.

If your production involves finishing
any type of cylindrical bore ranging
from 1/2" to 30" I.D. . . .

FULMER HONING WILL DO IT FASTER!



Almost any type of internal cylindrical surface is a *boning* possibility. The cylindrical surface can be long or short, open at both ends, closed at one end, containing different diameters, ports, shoulders or interruptions in the surface to be finished.

All of these surfaces can be finished *faster*, and *more economically*, by honing on Fulmer Honing Machines. Large amounts of stock can be removed rapidly, reducing costs of preceding operations. Working tolerances as close as $\pm .0001$ " can be held on bore size, straightness, roundness. Any surface finish from 1 or 2 micro-inches up can be produced. And Fulmer Honing Machines are simple to operate—many users have unskilled labor running them efficiently.

Put Fulmer Honing to work speeding and *improving* your production now. Get full details today.

CHECK THIS FOR FAST PRODUCTION HONING:

At Hunt-Spiller Mfg. Company, a Fulmer Model 15-48 Honing Machine is used to hone 12 1/2" diam., 42" length, Baldwin Gun Iron Diesel Locomotive Cylinders, removing from .012"—.015" of stock in from 10 to 12 minutes per piece.

C. ALLEN FULMER COMPANY

1242 First National Bank Bldg., Cincinnati, Ohio

FULMER

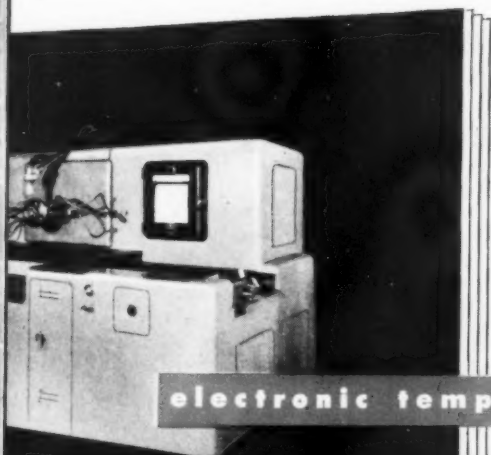
PRECISION PRODUCTION EQUIPMENT

★ Honing Machines • Rod Borers • Piston Ring Lappers

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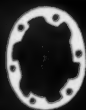


thousands will learn the meaning



electronic temperatur

ce hardening



NATIONAL METAL

SHOW • BOOTH 1510

**the new dimension in
selective service hardening**

flamatic

exhibit

Whether you make, buy, process, or use heat treated parts, join the thousands who will see the Cincinnati

Flamatic Exhibit at the Metal Show - featuring two difficult surface hardening jobs in actual production:

- cams for automatic torque converter transmissions
- take-off drive shafts for gear reduction units.

You will see how electronic temperature control - the new dimension in selective surface hardening - has led to higher physicals, better uniformity, faster production, and lower costs than ever before obtainable. Talk with

Flamatic engineers, get specific data that will help you apply Flamatic to your requirements . . . Don't miss the Show! Don't miss Flamatic!

*** Write for special Show Booklet, "The New Dimension In Selective Surface Hardening."**



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Cincinnati 9, Ohio, U.S.A.

How Hard *are GISHOLT'S* *Hardened Ways?*

to show you . . .

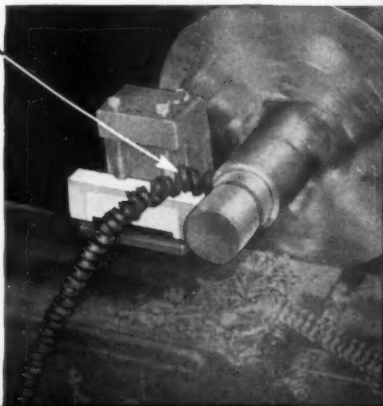
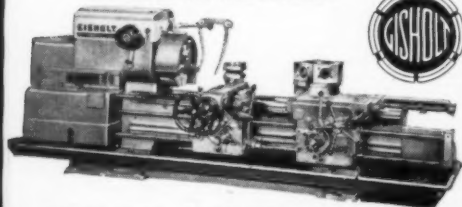
*We took a section from
the bedways . . .*

made it into a tool bit . . .

and cut metal with it!

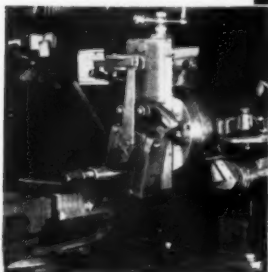
Here it is, turning a shaft of 1045 cold rolled steel. This illustrates how precision is "hardened" into Gisholt Turret Lathes with all working surfaces hardened to 64-66 Rockwell C on ways, gibs and clamps. This extreme hardness makes Gisholt ways practically wearproof—insures life-long accuracy—the kind of accuracy you want specified in your next turret lathe.

GISHOLT MACHINE COMPANY
MADISON 10, WISCONSIN



**TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS
BALANCERS • SPECIAL MACHINES**

Power down feed speeds
vertical facing and slotting.



Supplementary
table top for
extra large
clamping space



Auxiliary front cross feed is
very helpful for developing
contours.

The Cincinnati automatic tool
lifter is essential for carbide
tools and high speeds.



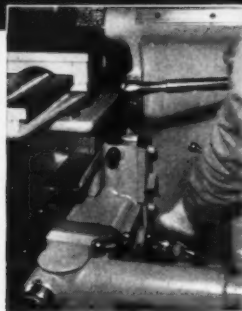
FAST SHAPING

...and wide utility, too!

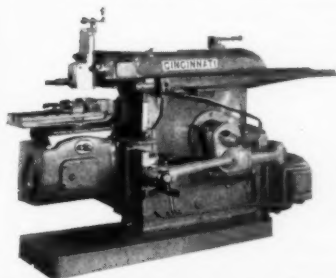
Powerful Cincinnati Shapers are tailored to your needs—the many features available to you will both speed your job and widen the use of a shaper in your shop.

Cincinnati Shapers are accurate, speedy and versatile. They are the handy man of industry.

Write for Catalog N-3, describing the many features and many types of Cincinnati Shapers available to you.



Power elevation to the rail, with
all controls convenient to the
operator, reduces setup time.



A Cincinnati Shaper with
universal table is especially
useful for tool room and die
work.



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CINCINNATI 25, OHIO U.S.A.

SHAPERS • SHEARS • BRAKES



ONE OIL DOES TWO JOBS

One New Sunicut Grade with Petrofac* Replaces Two Oils, Gives Improved Performance and Lowers Costs

Part: Knurled rise nuts for 14" and 18" Stillson wrenches

Operation: Spot, drill, knurl, and cut off

Machines: New Britain Model 61's

Materials: SAE X1112 and X1113 Bar Stock

Tools: Rex AA High-Speed Tool Steel

Cutting Speed: 156 S.F.P.M.

Cycle Time: 9.9 seconds

Production: 363 pieces per hour per machine

A manufacturer of wrenches was using two oils in his automatic screw machines—a dark cutting oil and a lubricating oil. Replacing both with one grade of new Sunicut with Petrofac, he found the way to many benefits. Savings have been substantial. Dilution of cutting oil through seepage

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The new Sunicut grades with Petrofac possess superior metal-wetting, antiweld and extreme-pressure qualities. They are not blended with animal or vegetable fatty oils—cannot turn rancid. For more information write for folder MT-10

SUN OIL COMPANY • Philadelphia 3, Pa.

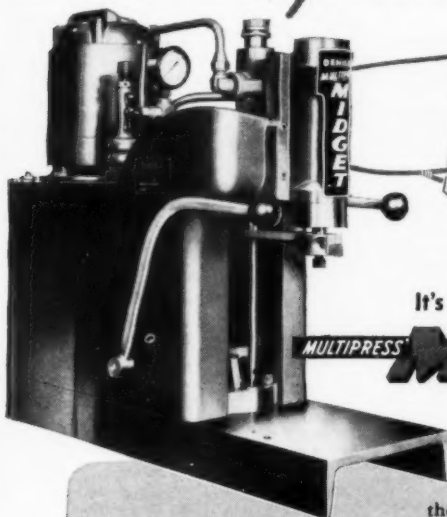
*In Canada: Sun Oil Company, Ltd.
Toronto and Montreal*

SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY



Denison Announces a Complete

Oil Hydraulic Press



for only
\$325.00
Less motor and starter.

It's the NEW PACKAGED UNIT

MULTIPRESS

MIDGET

Now, for the first time, you can get a real MULTIPRESS, at a price comparable to other less versatile low tonnage equipment. Never before have the production-boosting, cost-cutting features of the MULTIPRESS been available in a 2000 lb. capacity press, and at this low price.

You'll get features in the new Midget which you can't get in any other type press. The oil-smooth hydraulic action exerts

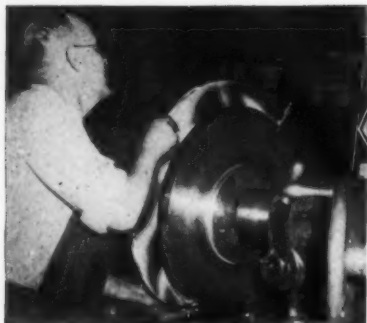
the same exact, preset pressure on the work—regardless of part size variation. There is no dependence on operator skill or "feel," and unskilled operators turn out high, reject-free production. Ram stroke, speed and pressure are all easily adjusted by controls at the operator's fingertips.

If you're looking for all-around adaptability, increased production and reduced rejects—you'll want the MULTIPRESS Midget. Write for details and ask for Bulletin M-15A.



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EQUIPMENT & SUPPLY
Hydraulics

THE **DENISON** ENGINEERING COMPANY
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TUMICO Tubular Micrometers Quickly and Easily Gage Work Diameters to 96"

**Light Tubular Structure
Cuts Operator's Fatigue in Ga-
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er-Touch" Feel Insures Precision
Measurements.**

Precision gaging of work diameters to 96" is both practical and possible with Tumico Tubular Micrometers. Because these micrometers are easily and quickly made on large diameters without tiring the operator, "feather-touch" feel insures precision gaging impossible with heavy solid frame micrometers or calipers. Tumico instruments are designed to reduce measuring time on all types of close work.

MORE TIME SAVING—PROFIT PRODUCING TUMICO PRODUCTS FOR YOUR NEEDS.



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bular steel Ad-
justable Limit
Snap Gages** are
up to 50% lighter
in weight than
solid type units
and offer un-
equalled "feath-
er-touch" feel
and balance.



**2. Tumico Tu-
bular Micrometers**
feature "feath-
er-touch" feel for
making repetitive
precision mea-
surements. They are
available in the

Series T fixed anvil type in size 0" to 96" and in Series M mandrel type in sizes from 0" to 106" both in sets or combination. Embodied in these micrometers are such important structural features as hardened and ground spindles, ground and lapped spindle threads, special alloy steel vacuum sealed frames, triple plated with copper, nickel and chrome and easy to read numerals.



**3. Tumico Pocket
Slide Calipers** ac-
curately measure
both outside and in-
side diameters. Deep,
clear, calibrations in
32nds and 64ths with
latter numbered for
rapid reading make
these desirable for
precision work. Read-
ings in English or
metric.



**4. Tumico Thrift Microm-
eters** are economically
priced units having drop
forge steel frames, hard-
ened anvils and spindle
tips. They are available
with ratchet stop and lock
ring, or Vernier scale in
size 0" to 6".

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Precision Measuring Instruments for
all standard and special requirements.

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WRITE FOR BULLETIN JD-101

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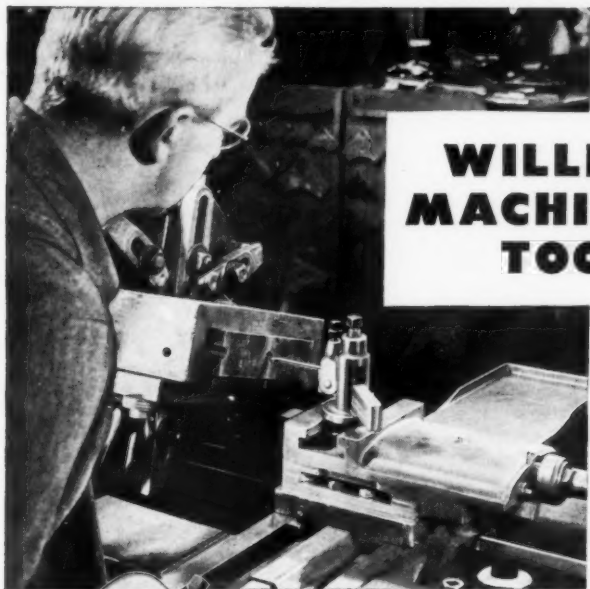


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281-9



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Williams Light, Boring-Tool Holder. A handy and economical tool for light boring, internal threading and turning.



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Lower

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"FIRST FOR SEEING"



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\$6.11 COMPLETE
(Net Industrial Price)



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Catalog No. 20 gives all the facts. Write for it.

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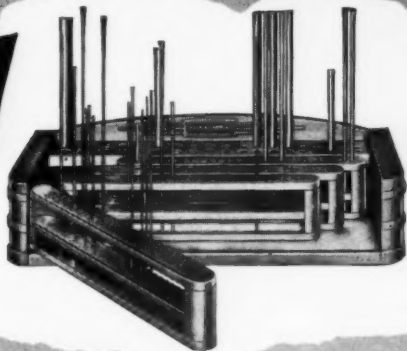
THE APEX MACHINE & TOOL COMPANY, 1029 S. Patterson Blvd., Dayton 2, Ohio

Safety Friction Tapping Chucks; Quick Change and Positive Drive Drill Chucks; Vertical Float Tapping Chucks; Parallel Floating Tool Holders; Power Bits for Phillips, Slotted Head, Frearson and Clutch Head Screws; Hand Drivers for Phillips, Frearson, Clutch Head Screws; Aircraft, Industrial Universal Joints; Sockets, Universal Joint Socket Wrenches

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ACRO DRILL ROD RACK

Here is a tool room unit you need to cut costs. Pays for itself several times over in time and labor savings alone.



COMPACT! BIG CAPACITY!

Holds 495 three-foot lengths in 133 number, letter, and fractional sizes including 1". Takes up shelf area only 27" wide x 12½" deep.

- *Each rod fits its individually sized hole.*
- *Holes plainly marked in sizes with their decimal equivalents.*
- *Instant rod selection.*
- *Stock check-up at a glance.*

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Users everywhere praise this money-saving tool. Indispensable for the grinding, mounting, and fitting of punches. Raises punch holders straight up with no pounding, no prying, no damage to set.

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Notice there is no struggle to separate the die set. Indexed Screw Wrenches* lift holder axially from die shoe. Operator raises or lowers die smoothly, safely, accurately . . . or holds it at any desired height.

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*Patented . . . Exclusively Acro

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Van Keuren GEAR MEASURING SYSTEM

Spurs, Helicals, Splines, Serrations-

The Van Keuren Gear Measuring System is generally accepted as the easiest and most accurate method of checking tooth thickness of gears, 30° involute splines and 90° involute serrations. A measurement is made over two opposing wires and this actual measurement is compared with the theoretical measurement over wires for a perfect gear as computed from the Van Keuren tables for 1 diametral pitch gears.

The only equipment required is a set of 2 wires of the proper size for each diametral pitch.

Standard sizes of wires available from stock are:--

DP 1.728"	for external spurs and helicals
DP 1.44"	for internal spurs and splines
DP 1.92"	for enlarged pinions, 30° involute splines and 90° involute serrations.
DP 1.68"	Alternate series for special requirements.

SIMPLE . . .

For spur gears, involute splines and serrations, the only calculation is one of simple division. For helical gears use the simplified computation forms VK-103, VK-104 or VK-105.

RELIABLE . . .

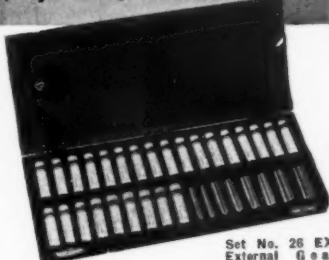
The 1.728"/DP System is used by over 90% of American gear producers and users. The 1.44"/DP and 1.92"/DP systems have been incorporated in standards for involute splines and serrations.

ACCURATE

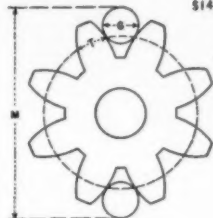
The Van Keuren Gear Tables are complete for gears from 5 to 500 teeth and for pressure angles of 14½°, 17½°, 20°, 25° and 30°. If the measurement over the wires is greater than the value calculated from the tables, the teeth is too thick and the cutter must be fed further into the gear blank. Constants for controlling tooth thickness and backlash to .0001" are given for all pressure angles.

The New 1948 Catalog and Handbook No. 34 is a 208 page volume, which has been in preparation for nearly two years. It contains new and epoch making formulas and tables for the exact measurement of screws and worms and complete tables and formulas for using the Van Keuren gear measuring system.

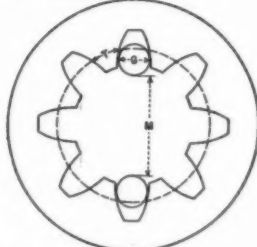
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Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Wires • Thread Measuring Wires • Gear Measuring System • Spline Triangles • Carbide Plug Gages • Carbide Measuring Wires



Put on—take off—as you
would a boring chuck—
Jig Grind—on your Jig
Borer or Mill.

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The Vulcanaire System . . .
Includes an adapter to fit the
spindle of your machine tool
Vacuum dust collector
Filter and Oiler
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When Jig Grinding is needed you can have it
quickly and economically with the VULCANAIRES.
Place it in the spindle of your jig borer (or mill).

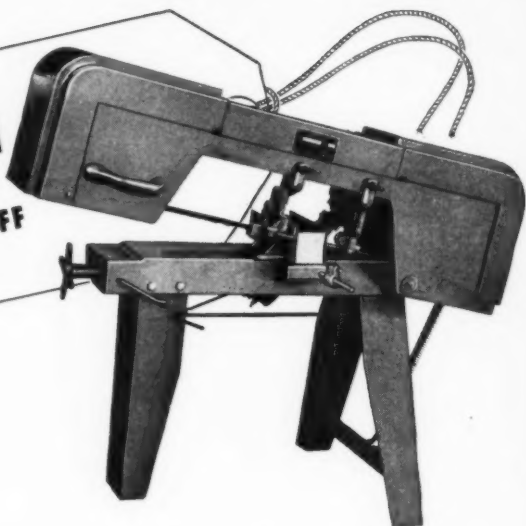
AND . . . Locate—Finish Grind holes in hardened
steel to "tenths" at controlled speeds up to 65,000 RPM

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- . . . Grind .032 to $\frac{1}{8}$ " holes with diamond impregnated
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THE *new*
JOHNSON
MODEL "B"
METAL CUT-OFF
BAND SAW

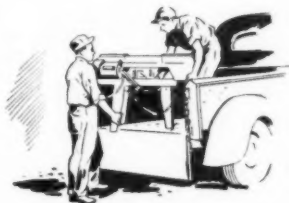


It's NEW, smaller, handier

Now shops with smaller, lighter cutting needs can get all the benefits of fast, continuous band saw cutting. The new Johnson Model "B" brings these advantages at low cost in a handy, smaller machine with capacity for 5" rounds and 10" flats. Weighing only 235 pounds, uncrated, this saw can be easily moved from job to job, anywhere. It's right for a variety of metal cutting jobs or for fast, mass production work.

While lighter and smaller, this newest machine has all the design and construction advantages of the larger Johnson saw. Structural features include a twist-proof, rigid box type frame, three point base to assure rigidity and stability regardless of uneven floors, and

three blade speeds of 45, 90 and 150 feet per minute. This new, versatile Johnson has many more features. Ask your dealer to demonstrate this saw now.



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THE *New* NORGREN TRANSPARENT BOWL FILTER

gives your air tools and cylinders effective protection against corrosive moisture and emulsions as well as abrasive solids.

- Directional air inlet (Tornado Jet) imparts swirling motion, separating and throwing moisture to outside wall.
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- Baffle plate divides bowl into ACTIVE and QUIET zones—*active*, where moisture separation takes place, *quiet*, where moisture accumulates for draining off instead of being driven along due to exposure to air turbulence.
- Reinforced Monel wire screen stops all solids.
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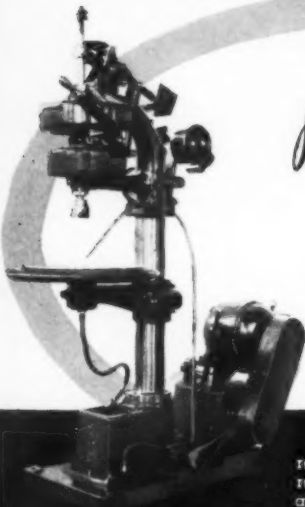
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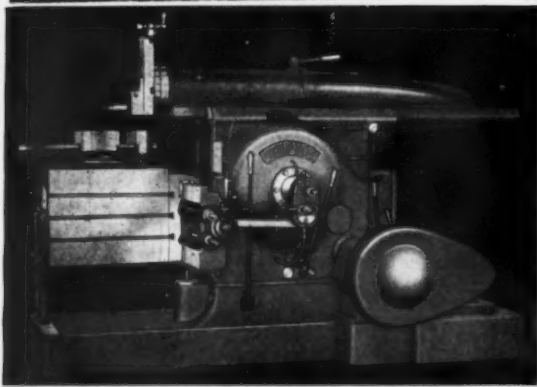


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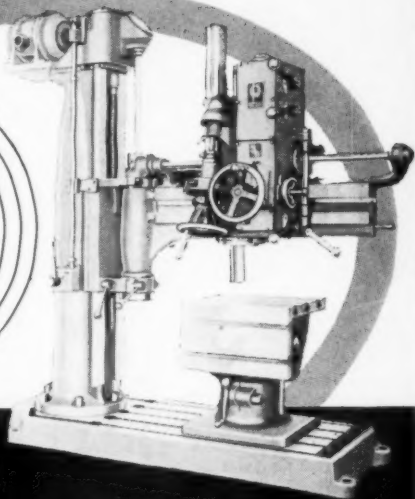
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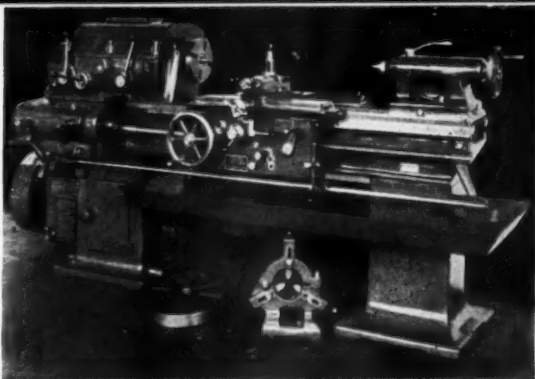
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WESTERN
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WESTERN HIGH SPEED RADIAL
DRILLS—for high economical production — "Low Hung" spindle drive —
12 speeds in head, 40 — 2000 R.P.M.
— made in six sizes — Ball bearing throughout —
Write for catalog No. B4431.

CHARD LATHES —
Timken bearing equipped
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● KRW Hydraulic Presses—either Hand operated, Air operated or Motor driven—are so flexible in design and operation, that a little ingenuity plus a few simple and inexpensive dies often result in tremendous time and cost savings.

Gone is the old fashioned theory that most forming, blanking and stamping operations must be done on large, cumbersome presses. On the small run production job illustrated here, a farm machinery manufacturer was able to save considerably in both die and production costs by utilizing a standard KRW 75-ton press and low-cost dies as shown at the right.

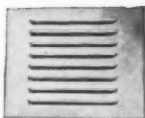
Today, the term "arbor press" is a misnomer. In countless plants KRW Presses are doing thousands of jobs that, a few years ago, would have been done on larger equipment. KRW Hydraulic Presses are built in sizes varying from 25 to 100-ton capacities. All but the 100-ton press can be furnished as either hand operated, air operated or motor driven. Openings, bed widths, heights, etc. can be varied at very little extra cost to meet particular needs.

Before you buy a press, remember this truth—more often than not, "you don't need a sledgehammer to drive a tack." You can save plenty by bringing your production problem to KRW first. We're equipped engineeringwise to offer real help, no obligation of course.



INEXPENSIVE DIES AND A KRW PRESS

Illustrated at the left are the low-cost dies used by John L. Bubb Farm Machinery Co. of Baldwinville, N. Y. on their KRW Press to form louvers in 16 ga. sheet steel as shown at the right. 3 tons pressure is required to shear and 10 tons to form the louver. This is a highly economical set-up for the limited production necessary.



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Please send me complete information on KRW Arbor Presses ☐
100-ton Hydraulic Presses ☐

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FASHIONED
is Expensive**

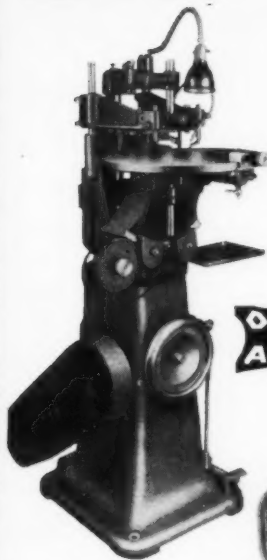
Use the OLIVER DIE MAKER and Save 60%

Smart production men don't buy a new piece of equipment just to be "modern". There must be a good reason for a change—a gain in economy, productivity or better workmanship.

OLIVER Die Makers are cutting as much as 60% from die making costs in hundreds of plants where they have replaced expensive, old-fashioned methods of drilling, chipping and hand filing. **THESE FIRMS ARE DOING A BETTER, MORE ACCURATE JOB OF DIE MAKING AND GETTING LONGER LIFE FROM THEIR DIES.**

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Costs still rising? Here's one place where you can beat them down. **WRITE TODAY FOR DIE MAKING CATALOG.**



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IT'S THE BACKBONE
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TOOL & CUTTER GRINDERS—DRILL
POINT THINNERS—TEMPLATE
TOOL GRINDERS—FACE MILL
GRINDERS—DIEMAKING MACHINES**

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—then it's a cinch you'd better change to the dresser with the
"EDUCATED DIAMONDS"
 (They stand abuse . . . and can't come loose!)

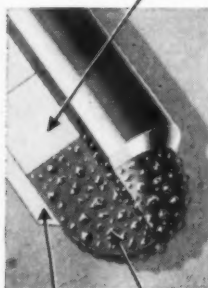
Imbedded in a matrix of super-hard Carboloy Cemented Carbide, these keen-cutting diamond points stand *real abuse* . . . they can't come loose! They hold on "for dear life" throughout their entire period of usefulness.

You not only save on diamond replace-

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Savings in diamonds, savings in time! Worth investigating? Sure it is. Send in the coupon asking for free booklet. There's no obligation . . . and you stand a chance to save up to 40% on dressing costs!

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Please send me free booklet No. DR-480, describing how these Carboloy dressers can save up to 40% on my dressing costs.

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Trouble free, profitable Conomatics are easy on your muscles and easy on your nerves. Take a holiday from worry with a Conomatic on the job.

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Progress with Conomatics

Buffalo Niagara Electric has a new 150,000 horsepower transformer that is said to be the largest in the country.

Conomatics for Progress

Continental Die Casting Corp. of Detroit has found a way to combine gold and chrome plating on a single piece of metal.

Progress with Conomatics

Glenn L. Martin Co. has developed the airplane hydraulic brake for automobile use.

A new searchlight for Coast Guard cutters projects 32 million candlepower from a 900 watt mercury light source that is no bigger than a kitchen match.

Conomatics for Progress

The Custer channel wing plane has been successfully flight-tested and is to be made by National Aircraft Corp., Hagerstown, Md.

Progress with Conomatics

A new movie screen that is a section of a sphere and can be made to fill half the wall space of a theater has been patented. The rights have been assigned to Vitarama Corp.

Conomatics for Progress

Toledo Scale Co. has a new line of computing scales adapted to the present day price ranges of groceries.

Progress with Conomatics

Heil Co. of Milwaukee has a new dump truck with 18½ cu. yds. capacity.

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Conomatics for Progress

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Progress with Conomatics

The Conomatic frame construction is one reason why Conomatics operate at lower cost. The frame was not "inherited", it was designed. The short, well proportioned, upright frame members give better support to the tooling area than do taller, less rugged upright members of competitive machines.

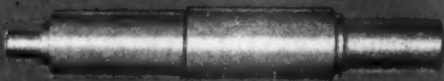
Conomatics for Progress

The world's most powerful electrostatic accelerator will be constructed for the Los Alamos Scientific Laboratory of the University of California.

Progress with Conomatics

Minnesota Mining & Mfg. Co. has a new tape of adhesive that is said to bond metals, fiber, wood or plastics with a sheer strength up to 3,500 p. s. i.

put *Usual* jobs on any Automatic
put *Tough* ones on a CONE

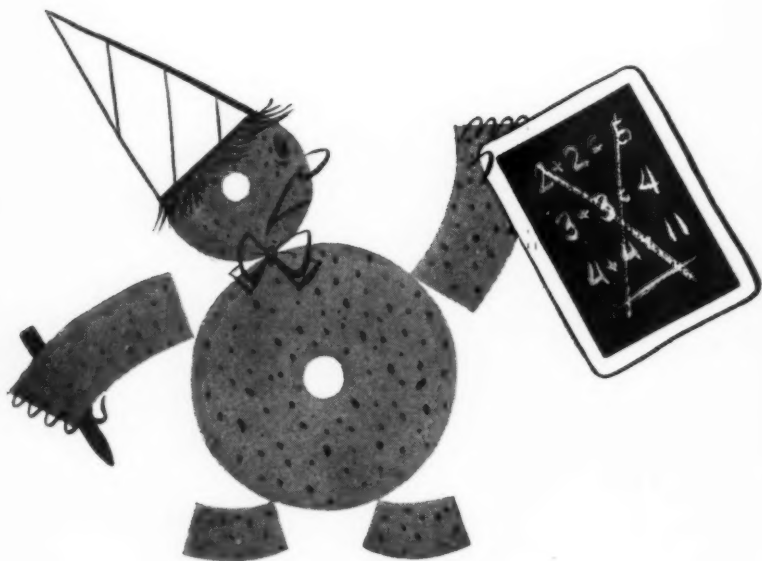


The transmission shaft shown is made from hot rolled molybdenum steel by a 34" Sx in 71 seconds.

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AUTOMATIC MACHINE CO., INC.
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When multiplication is
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Grinding Wheels

Worried about production and increased costs? Have you examined your method of cost analysis? Are you designing products that can be ground instead of machined? Are you wasting time on your grinding operations?

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You can count on results like this from Robertson Grinding Wheels: A large manufacturing plant was grinding cotters made from drop forgings. Taking off 1/16" stock on a plunge cut, it was getting only 25 pieces per wheel-dressing. When a Robertson sales-engineer was called in, he studied the problem and recommended a Robertson SA 549-QV wheel. Immediately production rose to 125 pieces per wheel-dressing—an increase of 400 percent!

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**...more easily
...give you CONSISTENT
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Here's top value for your file-dollar. Simonds makes "Red Tangs" in top grade only . . . and that's the only grade of work you get from them. Tell your Distributor you want "Red Tangs" on your next order. Then check the difference in your production.

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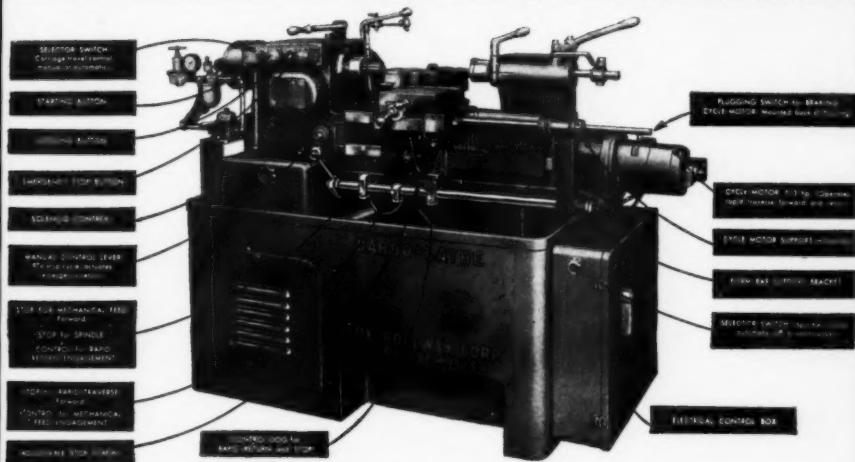
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For fast, simple operation, just push the starting button . . . Instantly the spindle starts, the carriage moves rapidly up to the cutting position, and the mechanical feed engages automatically.

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YOUR PRESENT LIME
CARBO-LATHES**

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The selector switch permits continuous operation of the spindle. The push button or remote limit switch starts feed at the beginning of cycle. Complete change of set-up can be made in just a few seconds by moving only three adjustable stops.



Lipe - ROLLWAY CORPORATION



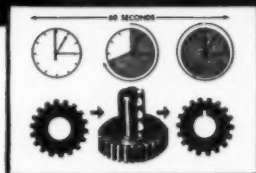
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You simply drop the right size bushing in the bore, insert the precision broach and press it through, using a shim and second pass to get the exact depth. In sixty seconds you have a clean, accurate keyway in any gear, pulley hub, coupling, collar, milling cutter or what have you.



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Please mail me the *Minute Man* Manual "T" containing complete information, prices and valuable reference data.

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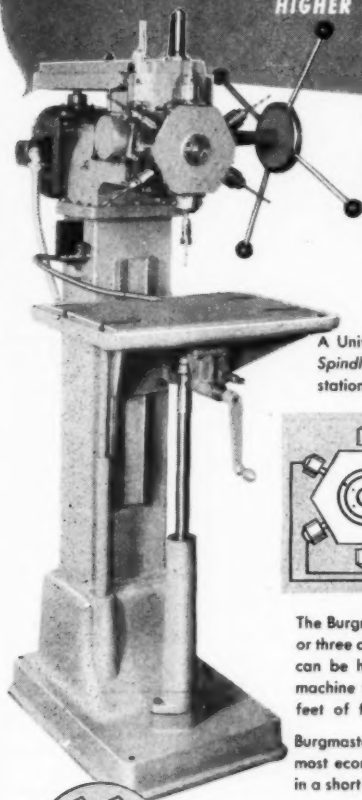
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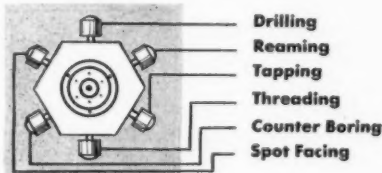
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SIX SPINDLE

TURRET TYPE AUTOMATIC INDEXING

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A Universal Type Production Machine with Pre-selective Spindle Speeds that changes quickly through individual stations for...



The Burgmaster enables one operator to do the work of two or three and get the job done faster, better. A variety of jobs can be handled without moving the work piece from the machine table. It is simple to set up, requires but 6 square feet of floor space and is powered by a single motor. Burgmaster users will tell you that their Burgmaster is the most economical machine in their shop, and pays for itself in a short period.

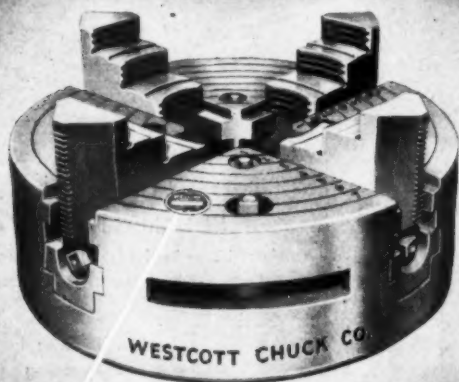
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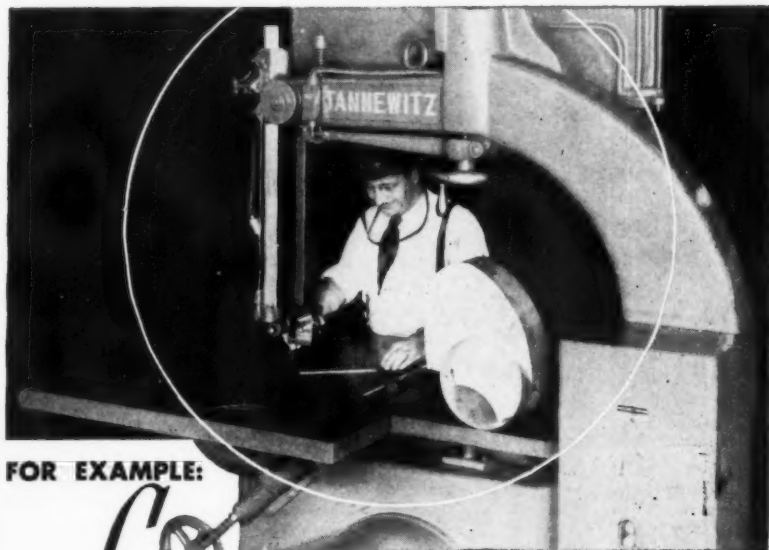
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FRICTION SAWING

solves thousands of Problems!



FOR EXAMPLE:

CUTTING side panels of a barometric damper as shown above. Cost of dies required for seven sizes would have approximated \$12,000 — a prohibitive sum for volume required on these sizes. Friction-sawn on a TANNEWITZ High Speed Band Saw in multiples of two in 1.2 minutes each — a very moderate cost which makes feasible the complete line required. Cost of machine was only a small fraction of cost of dies contemplated and it is also available for many other uses.

For trimming castings, formed parts, cutting metal as hard as a file and dozens of other operations, too, friction sawing with TANNEWITZ High Speed Band Saws offers tremendous advantage. Write for free booklet, "FRICTION SAWING."

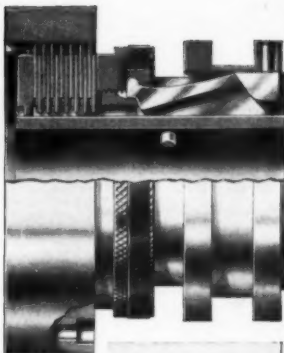
THE TANNEWITZ WORKS

GRAND RAPIDS 4,
MICHIGAN

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MAXITORQ

**KEEPS
GOOD
COMPANY**



Shown above are the Maxitorq Floating Disc Clutch and the modern Steve-Krane Stevadore 5 ton capacity Crane, manufactured by the Silent Hoist & Crane Co., Brooklyn, N. Y.

The Maxitorq is inside the winch and transmits the power for Hoisting and Lowering for the load line.

Here's a further instance of the fast growing adoption of Maxitorq Clutches by nationally known manufacturers.

Other product or machine designers, manu-

facturers of machine tools or machinery may also find that Maxitorq has the "extra" features they need.

For instance . . . compact, streamline design; patented Separator Springs that keep discs apart in neutral . . . no drag, abrasion or heating. No tools needed for assembly, adjustment, take-apart. Shipped completely assembled ready to slip onto a shaft. Capacities to 15 H.P. at 100 r.p.m., wet, dry, single or double.

Want to join our "Good Company" family?

Send for Catalog BB10



THE CARLYLE JOHNSON MACHINE COMPANY
MANCHESTER • CONNECTICUT

A NEW COOLANT-



**HIGHER
SPEEDS**



**HEAVIER
CUTS**



**LONGER
TOOL
LIFE**

Ahcowet C G applies a new principle to water emulsions for reducing heat and friction in metal and plastic operations. A product of New England's oldest industrial chemical company. Tested and proven in some of America's largest industrial plants.

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**AHCOWET
CG**

takes the heat off
metal cutting problems



ARNOLD, HOFFMAN & CO., Inc.
Machine Tool Division

55 Canal Street, Providence 1, R. I.

Please send me information about Ahcowet C G

Name

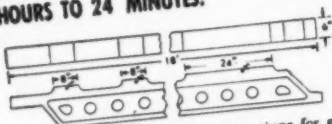
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KENNAMILLING CUTS MACHINING TIME FROM HOURS TO MINUTES

ON STEEL

**"UNIVERSAL" FACE KENNAMILL
CUTS MACHINING TIME ON
CAST STEEL BEAMS FROM
3 HOURS TO 24 MINUTES.**



It took 3 hours and 2 separate operations for a HSS cutter and a carbide-tipped cutter to rough and finish mill four of these cast steel beams, and finish mill four of these cast steel beams, having heavy sand inclusions. A "Universal" Face Kennamill removes the metal in one pass—gives superior finish—and reduces machining time 87%.

The "Universal" Face Kennamill is today's outstanding carbide cutter for milling steel. Its features include solid, advanceable Kennametal blades of tremendous strength and wear-resistance; a steel cutter body with precision-ground slots that support the Kennametal blades perfectly; and mechanical clamping that securely holds the blades with complete absence of strain.



KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

There are standard Kennamills available for most face milling operations. See particulars in Catalog 48. Write for your copy.



HALF-DISK KENNAMILL
(Solid blades)



"C" KENNAMILL
(Solid blades)



STEP KENNAMILLS
(Kennametal-
tipped blades)



"DOD-JOB" FACE KENNAMILL
(Kennametal-
tipped blades)

ON CAST-IRON

**AXIAL FACE KENNAMILL
ROUGH AND FINISH
MILLS IN ONE PASS.
TURNS OUT 627 CYL-
INDER HEADS BEFORE
REGRINDING.**



This is typical performance by the Axial Face Kennamill—a total of 18,755 square inches milled on cast iron cylinder heads before the blades required sharpening. Even then, the blades were in very good condition, and were reground only in order to maintain the high finish required on the manifold face of the piece.

The Axial Face Kennamill has solid blades of extremely abrasion-resistant Kennametal that give extended service without need for sharpening. It is designed for high rate milling with light or medium cuts on cast-iron. Grinding simplicity is one of its many cost-cutting features—it can be sharpened in a tool and cutter grinder, and usually only two surfaces on the blades need to be redressed.

GORTON Duplicators Give You

Production Plus . . .

Lower "Short Run" Costs

Gorton Duplicators are highly versatile and are designed for profiling and duplicating all kinds of dies and molds for plastics, rubber, glass, drag forging dies, metal patterns, die casting dies. They are precision built to handle either production assignments or short runs.

For example, the Jacobson Manufacturing Co. of Racine, Wisconsin had a small quantity of piston heads reshaped to a complicated design for the purpose of reducing compression. These were for small gasoline engines. To do this by conventional methods, would have taken several hours per piece. The time per piece on the Gorton was less than 20 minutes . . . (See Job Facts) . . . and each was an exact duplicate in shape and dimensions — an important requirement in this case.

Gorton equipment may save you money. Write for free Bulletin 1655 — see coupon below — or inquire about Gorton Engineering Service.

JOB FACTS!

JOB "Short Run" duplicating of piston head shape
MATERIAL Aluminum Alloy
MACHINE Gorton Duplicator with Tracer Control
CUTTERS $\frac{3}{8}$ " Tung-carbide shaped to fit angles of master; 2 flute
SPEED 4560 R.P.M.
NO. OF PIECES 20
SET-UP TIME 4 hours
TIME TO FINISH 6 hours (all 20 pieces)
REMARKS Minimum hand work required. Same cutter and stylus used throughout. Die, of pistons 2" Max. depth of cut 15/32".



GEORGE GORTON MACHINE CO.
Tracer Controlled Milling
 1410 RACINE STREET, RACINE, WISCONSIN, U. S. A.

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STANLEY UNISHEAR
CUTS 18 GAUGE
(No. 218)



Weights only a little more than a pair of snips. Cuts your costs on sheet metal work. Zips through 18 gauge steel at speeds up to 15 feet a minute . . . straight ahead, curves, angles, notches . . . inside or out . . . right on the line. "Feeds in" the work so operator only has to guide it. Blades easily removed

for sharpening. Aluminum alloy housing, ground gears, ball and roller bearings, slide operated switch, duplex handle. A real production tool for fast cutting of sheet metal. Sold through your industrial distributor. Write for literature. Stanley Electric Tools, 512 Myrtle St., New Britain, Conn.



CRADLE for converting the No. 218 to a rigid, bench power shear.

CIRCULAR CUTTING ATTACHMENT for cutting perfect circles up to 20".

THE GREATEST NAME IN TOOLS

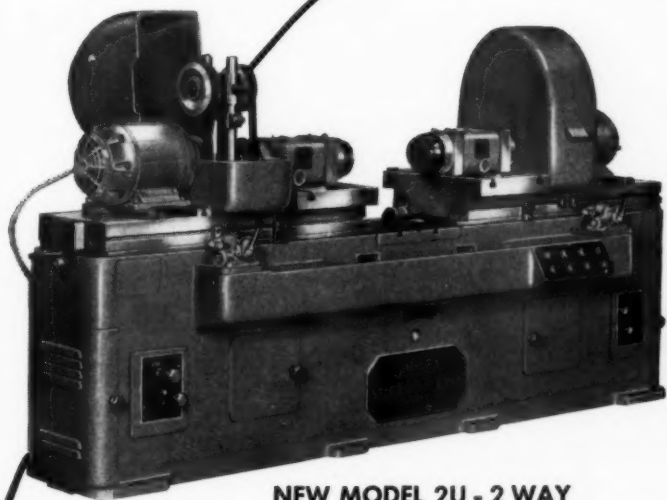
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NEW MODEL 2U - 2 WAY

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4530 West Mitchell Street

MILWAUKEE, WISCONSIN

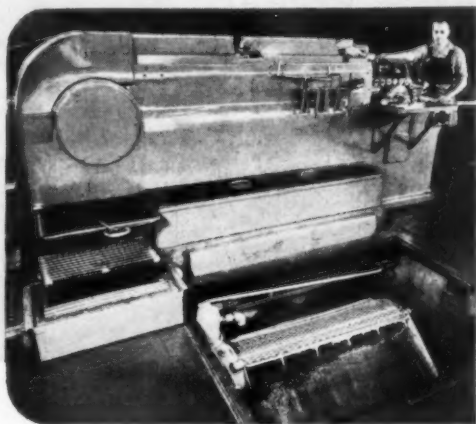
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Eliminate STICKY FIXTURES

WITH
BARNESDRIL
Automatic
**COOLANT
SEPARATOR**

Exemplar
Foote-Burt Broaching Machine



★ Timken Roller Bearing Company surface broach Rock Bits for the mining

and contracting industries at their Colorado Springs plant. Fine sludge and chips accumulating from this operation foul the coolant and collect in the fixtures, causing them to stick and jam. These fixtures are precision-designed with gears, sleeves, and other intricate parts, and the problem of periodic maintenance, along with shutting down the machine has been a serious cost problem.

BARNESDRIL engineers working closely with plant production officials, installed a No. 10 **BARNESDRIL** Coolant Separator on this job which automatically removed all particles from the coolant. As a result, this difficult fixture problem and a disagreeable job of cleaning sludge and sediment from the reservoir have been eliminated. Direct savings in cost have paid for the separator several times.

Why not check the application of **BARNESDRIL** Separators on your grinding, honing, shaving, shaping and broaching operations for similar savings and efficiency.

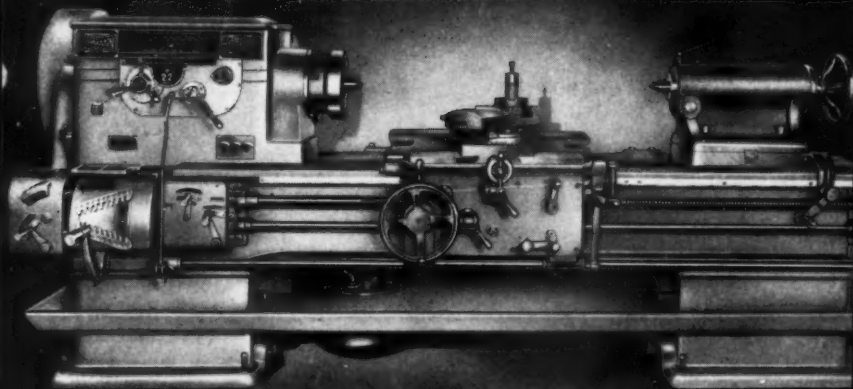
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BARNES DRILL CO.

552 CHESTNUT STREET ROCKFORD, ILLINOIS U.S.A.

Read this Strong Endorsement of HYDRATROL LATHES!

"Our 22" Hydratrol Lathe has carried
up to 27½ HP for 7 years without
one cent of maintenance cost" *
THE MEDART COMPANY, ST. LOUIS



* This well-known manufacturer of power transmission equipment adds:

"We naturally have purchased additional machines of this type of performance. We now operate in addition to this 22" Lehmann, two 27" Lehmann's (one with 25' bed), and one 18", and all of them are performing just as satisfactorily as the unit we purchased in 1941.

"Naturally the later model machines have some additional refinements, which make them somewhat the favored machines because of their greater production capacity. However, it is the Hydratrol feature on all of them that makes our production superintendent specify 'Lehmann' every time."

ABOVE ILLUSTRATION shows the Standard HYDRATROL — Heavy Duty 22" — 25"; Extra Heavy Duty 32" — 36".

We also make the famous Hollow Spindle HYDRATROL — 18" to 36".

In hundreds of plants, under all sorts of conditions, HYDRATROL Lathes are setting new records for speed, accuracy, dependability, economy. They operate with almost unbelievable smoothness, and do extremely close tolerance work.

You'll do it better on a HYDRATROL! Send us prints for a specific, time-and-money-saving recommendation.

Lehmann
MACHINE COMPANY

CHOUTEAU AT GRAND • ST. LOUIS 3, MO.

The 3B EXCELS..

**In the Toolroom...
On Production Line...**



The Abrasive 3B Surface Grinder is equally adapted for toolroom use and production line. With quick-change versatility it's the ideal flat grinder for jig, die, and gage making in the toolroom. On production runs, automatic longitudinal and transverse feeds speed the output of top-notch precision work ... the 3B meets heavy production schedules on time, all the time. Has large capacity: the 3B takes work up to 24" long, 8" wide, and 12" high. Massive bed construction, smooth running spindle and vibration-free table travel mean extreme accuracy and fine finish on every job.

Write for Bulletin.

ABRASIVE MACHINE TOOL CO.
EAST PROVIDENCE 14, RHODE ISLAND, U. S. A.

SPECIFICATIONS

Table size overall: 59" x 10½"

Spindle: 2290 R.P.M. Cartridge type

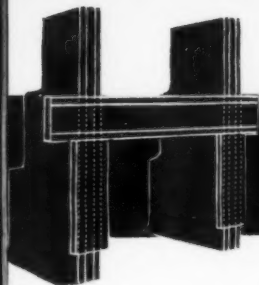
Drive: 3 H.P. motor

Wheel Size: 10" standard. 8" or 12" available on request

Net Weight: 2670 lbs.

ABRASIVE

ACCURACY BOOSTS PRODUCTION



ROCKFORD *Hy-Draulic* DESIGN-POINT

for more accurate—
faster, planer work...

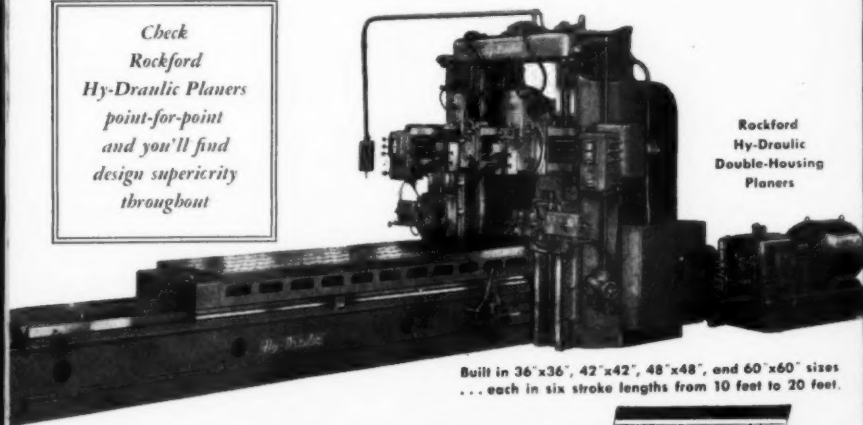
There are many reasons other than hydraulic drives and feeds that make Rockford Hy-Draulic Planers easier to operate, more accurate, and faster. One good example of better design is found in the cross rail construction of the Double-Housing Planer, as illustrated schematically above. At each end of the cross rail, as an integral part of the cross rail casting, is a long guide-way member. The total bearing surface provided between cross rail and column is as much as 300% greater than found in conven-

tional planer design. The result is a precision alignment between cross rail and table... that is dependably maintained under all conditions. Rockford Hy-Draulic Openside Planer cross rail members are of similar design.

For complete information on Rockford Hy-Draulic Double-Housing and Openside Planers... for complete data on Rockford Hy-Draulic point-for-point design advantages... write for Catalog 1947.

ROCKFORD MACHINE TOOL CO.
ROCKFORD, ILLINOIS

*Check
Rockford
Hy-Draulic Planers
point-for-point
and you'll find
design superiority
throughout*



**Rockford
Hy-Draulic
Double-Housing
Planers**

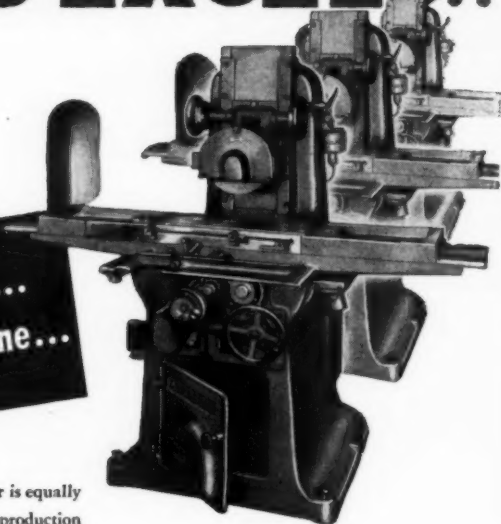
Built in 36"x36", 42"x42", 48"x48", and 60"x60" sizes
... each in six stroke lengths from 10 feet to 20 feet.

**ROCKFORD Hy-Draulic Ram Type SHAPERS • 36" OPENSIDE SHAPER •
PLANERS • SLOTTERS • and SHAPER-PLANERS**



The 3B EXCELS..

**In the Toolroom...
On Production Line...**



The Abrasive 3B Surface Grinder is equally adapted for toolroom use and production line. With quick-change versatility it's the ideal flat grinder for jig, die, and gage making in the toolroom. On production runs, automatic longitudinal and transverse feeds speed the output of top-notch precision work ... the 3B meets heavy production schedules on time, all the time. Has large capacity: the 3B takes work up to 24" long, 8" wide, and 12" high. Massive bed construction, smooth running spindle and vibration-free table travel mean extreme accuracy and fine finish on every job.

Write for Bulletin.

ABRASIVE MACHINE TOOL CO.
EAST PROVIDENCE 14, RHODE ISLAND, U. S. A.

SPECIFICATIONS

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Spindle: 2290 R.P.M. Cartridge type

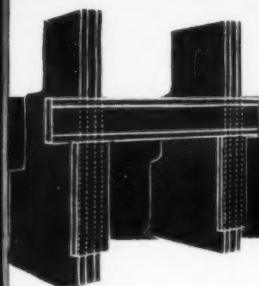
Drive: 3 H.P. motor

Wheel Size: 10" standard. 8" or 12" available on request

Net Weight: 2670 lbs.

ABRASIVE

ACCURACY BOOSTS PRODUCTION



ROCKFORD *Hy-Draulic* DESIGN-POINT

for more accurate –
faster, planer work...

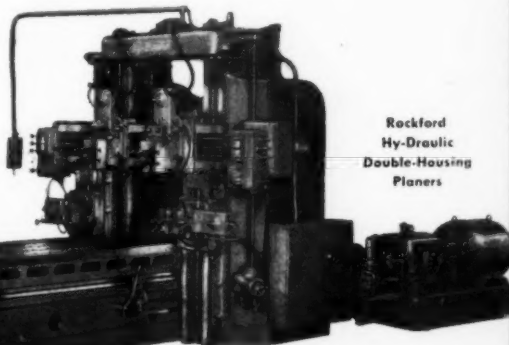
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ROCKFORD MACHINE TOOL CO.
ROCKFORD, ILLINOIS

*Check
Rockford
Hy-Draulic Planers
point-for-point
and you'll find
design superiority
throughout*



Rockford
Hy-Draulic
Double-Housing
Planers

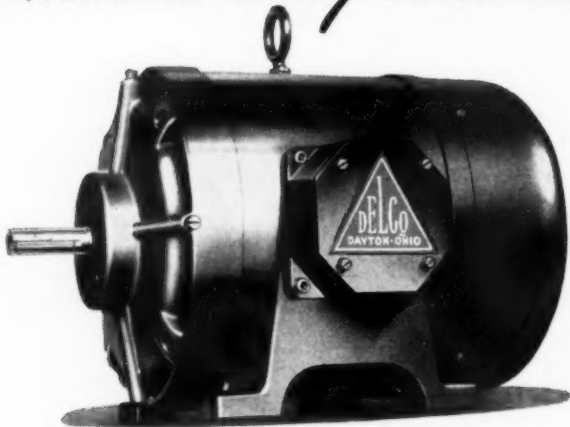
Built in 36"x36", 42"x42", 48"x48", and 60"x60" sizes
... each in six stroke lengths from 10 feet to 20 feet.

ROCKFORD Hy-Draulic Ram Type SHAPERS • 36" OPENSIDE SHAPER •
PLANERS • SLOTTERS • and SHAPER-PLANERS



DELCO MOTORS

Eliminate costly down-time



Do away with profit-eating down-time! For dependable power, depend on Delco to provide industrial motors that stand up to their job . . . motors able to withstand the attacks of dirt and dampness, yet requiring the very minimum of maintenance.

Delco totally enclosed fan-cooled motors are produced in sizes ranging from fractional ratings to 75 h.p. (Continuous duty, constant speed, 60 cycle, polyphase.)

The Delco totally enclosed fan-cooled motor assures continuous, trouble-free power. Special features of Delco design—locked bearings, Delcote coil insulation, corrosive-resistant cast iron frame, positive lubrication, dynamically balanced rotor and shaft assembly, water-tight four-position conduit box—contribute to reliability and to economy of operation.

So, eliminate costly down-time . . . investigate the Delco industrial motor line. There's a Delco that's **RIGHT** for your job.

For complete data on Delco Motors, address Delco Products, Dayton, Ohio, or our nearest sales office.

DELCO MOTORS

DIVISION OF GENERAL MOTORS CORPORATION, DAYTON, OHIO

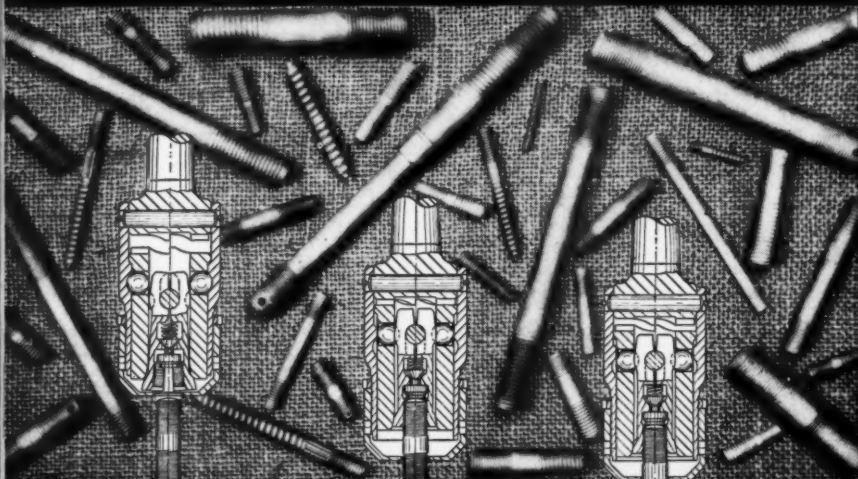
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MACHINE and TOOL BLUE BOOK



STUDS

and the tool to set them



Tool in position
over the stud,
ready to start the drive.
Jaws are open to take the
stud.

Start of the
drive with tool
engaged on the stud.
With jaws locked.

Drive complete,
stud driven to full
depth. Stop collar
contacts the work, releasing the
clutch. Lifting the tool opens
the jaws.

MODERN SELF-OPENING STUD SETTER

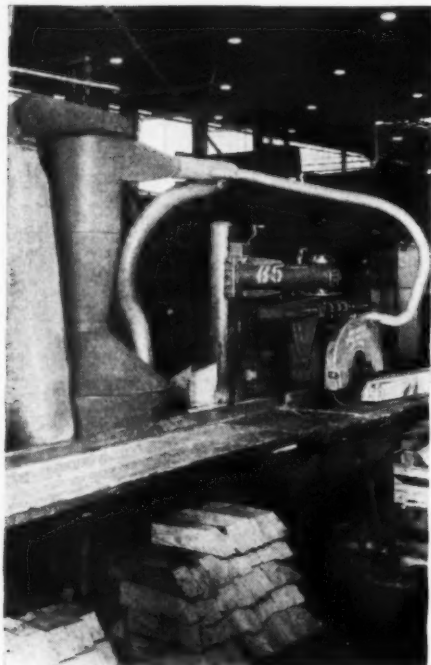
As the action of this tool is positive and automatic, it is conveniently operated in any position with either air or electrically operated portable tools. It is also adapted to use in a drill press where it is possible to drill and tap the holes and set studs in successive operations.

**Let Modern Engineers help with your stud
setting problems—send for Bulletin M-186**

MODERN TOOL WORKS

DIVISION OF
CONSOLIDATED MACHINE TOOL CORPORATION
ROCHESTER 10, NEW YORK

TORIT DUST COLLECTORS



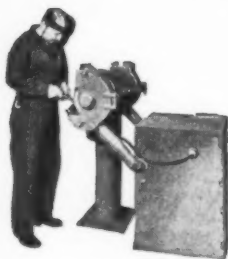
keep the
"chips from flying"
on this swing saw

Wood sawing operations are a major factory nuisance. Each cutting releases large volumes of saw dust, ranging from fair sized chips to a fine wood flour. These have an adhesive quality that makes cleaning operations difficult.

The circular swing saw illustrated here is used for cutting hardwood timbers. Suction pipes, attached to the wheel enclosure, lead to a TORIT No. 13-FB Dust Separator. The heavier particles are removed by the cyclone unit and the fine dust in the after filter.

This installation eliminates the need of a central dust system, with its maze of piping. It takes up little room. Operating only when the saw is running, it reduces costs.

Over 16,000 TORIT Dust Collectors are now cutting costs and solving the dust problem in every type of American industry. Models for all standard dust collecting jobs are now available for immediate delivery. For details and the latest TORIT catalog, write:



See our exhibit
Booth 760
National Metal
Congress
Philadelphia, Penn.

TORIT MANUFACTURING CO.

303 Walnut Street.

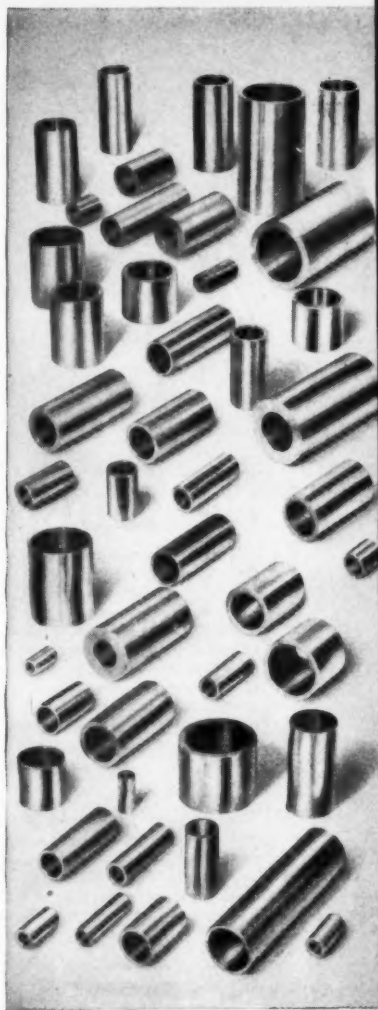
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1088 SIZES OF FULLY
FINISHED, READY-TO-USE

BUCKEYE BEARINGS

*CARRIED BY LEADING DISTRIBUTORS
FOR YOUR CONVENIENCE*

● Leading supply houses carry Buckeye Bearings to serve you better. Manufactured from selected materials under our rigid controls, Buckeye Bearings meet the most exacting specifications. Each is a quality product—free from porosity and accurately dimensioned within the required limits assuring speedy, easy assembly and a maximum of long, efficient, satisfactory service. Send for the Buckeye catalog, and order Buckeye quality bearings—by name and number—from your Buckeye distributor.



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6412 HAWTHORNE AVE.

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SINCE 1900

CLEVELAND 3, OHIO



BRONZE SLEEVE BEARINGS • STANDARD SIZES OR TO CUSTOMERS' BLUEPRINT



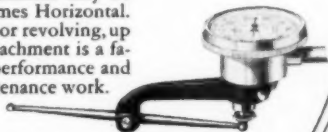
Use AMES Horizontal Indicators

The highly accurate, highly sensitive Ames Horizontal is the right indicator for right-angle readings. It is invaluable for tool room and production jobs where it is advantageous to have the dial in a horizontal plane, and on work surfaces where the use of regular indicators is impractical.

The Ames Horizontal is designed with the usual Ames approach of *sustained accuracy through simplicity*. Action is obtained through a rack and pinion—there are no spirals, cams or levers which might introduce wear and incorrect dial readings. Because of its sturdy, forged brass construction, any surface of the case may be used for mounting—or the regularly supplied holding rod may be used.

Be sure you're right at right angles, specify Ames Horizontals. Write for new bulletins describing all sizes and models of this modern gauge.

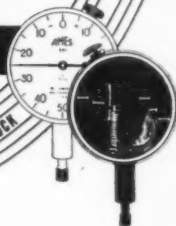
A Universal or Hole attachment may be clamped to the stem of the Ames Horizontal. It will check holes, stationary or revolving, up to $1\frac{3}{4}$ " deep. This Ames attachment is a favorite for speeding up the performance and accuracy of service and maintenance work.



Address inquiries to Home Office, 28 Ames Street

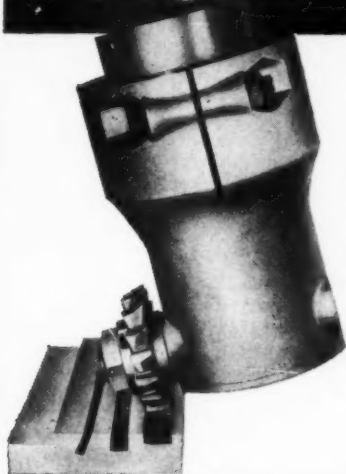
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AND MICROMETER DIAL INDICATORS
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principal cities*



NEW DOUBLE YOUR
MILLING CAPACITY
WITH THE...

Milmaster



**CONVERT ONE MACHINE
INTO A TOOL SHOP**

Angle Milling ★ End Milling
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COMPANY

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**WRITE
TODAY
FOR THE
DETAILED
FOLDER**

BEMIS & CALL COMPANY, 210 Main Street, Springfield, Mass.

Send me free folder giving detailed information about the
Milmaster "that converts one machine into a tool shop."

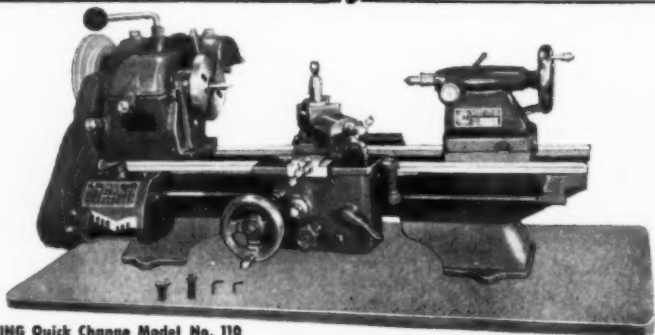
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YOUR NAME.....

ADDRESS.....

CITY.....STATE.....

Clausing LATHES



CLAUSING Quick Change Model No. 110

Swing over bed—12"

Swing over carriage—7½"

Distance between centers—24"

Accuracy THAT "STAYS PUT"

Exacting users prefer CLAUSING Lathes because of their adaptability, convenience, and sustained accuracy even after years of service.

CLAUSING Lathes are precision built for precision work. The bed is a solid close grained gray iron casting made rigid by inverted U and box braces. All beds are rough milled, seasoned, then rough and finish ground. Vee and flat ways are machined to within .001 inch of parallelism. Husky carriage is gibbed both back and front to prevent climbing and insure maximum rigidity. Bearing surfaces on cross slide, saddle, and tailstock are checked for close contact not just the high spots which may check accurate but quickly wear out of alignment. Compact headstock with built-in countershaft is a single streamlined unit guaranteed to within .001 inch of absolute accuracy.

CLAUSING Lathes roll smoothly on adjustable Timken tapered roller bearings—plenty of extra stamina for high speed and end thrust. Final machining of spindle is done with the spindle running on its own bearings, assuring concentricity.

Before you buy—investigate CLAUSING for economy, convenience, and accuracy.

Write for Literature

CLAUSING MANUFACTURING CO.

231 RICHMOND AVE.

OTTUMWA, IOWA



Rodgers PRESSES



Custom Built
...yet
versatile in use

Rodgers

UTILITY SHIPYARD PRESS
AND KEEL BENDER

An outstanding press to solve a particular problem.

Rodgers

300 TON
FORGING PRESS

Ideal for wheel, sprocket
or gear forcing... for
1001 pressing, straight-
ening or bending opera-
tions... available in
100 to 600 ton capacity.

Rodgers HYDRAULIC SHOP PRESS...

for the many miscellaneous jobs. Standard
presses are available in 60, 100, 150 and
200 ton sizes. Special 300 and 400 ton
presses made to order.



REGARDLESS of the type press you need, you'll find a sturdy dependable Rodgers press to meet the requirements. For Rodgers has long been a leader in the design and manufacture of outstanding presses for most every use.

For ordinary press requirements, there is a standard Rodgers press. If hydraulic equipment is needed to perform unusual production or maintenance jobs, the Rodgers engineering department will offer suggestions on the type equipment to use or design units to perform as desired.

All Rodgers presses are built under expert care and strict supervision. All units are guaranteed to withstand or produce the pressure that they were designed and advertised to perform.

Send for full information.

Rodgers Hydraulic, Inc.

Hydraulic Power Equipment

7453 Walker Street,
St. Louis Park, Minneapolis 16, Minn.

Portable Presses

Presses



Carbide Users:

***ADAMAS* ON THE JOB!**

Here are four applications where **ADAMAS tungsten carbide** is working. **ADAMAS job engineered grades can help you.**

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ADAMAS carbide prismatic tool bit for clamped tool holder—being used for machining heat-treated steel part of steering assembly from rough forging to finished size with **three times** the tool life of best competitive grade.



Business Machines



ADAMAS carbide wear resistant part—a necessary component of leading business machines—giving over **100 times** the service of steel part formerly used... at negligible increase in cost.



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ADAMAS carbide preformed tool tips—machining complex precision part for lathes with only **one** tool... tip preformed to specifications within one week required .010 finish grinding before use.



Bedsprings



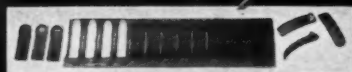
ADAMAS carbide wire straightening dies—die life now **150 times** greater... lapped groove eliminated scratching of wire... carbides previously used unable to withstand shock conditions.



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40-30 23rd STREET, LONG ISLAND CITY, NEW YORK

Producers of top quality carbide for cutting tools, dies and wear resistance—both standard and special.



120 Pieces
Per Minute

...from

3 1/2" x .018" Brass

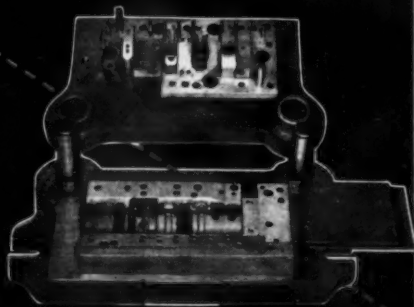


Photo courtesy of Federal Tool Corporation, Chicago

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Save Time...

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Assembly plants (marked with stars) stock interchangeable parts for quick assembly and delivery of any standard die set to your specifications.

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Precision Guiding Required on Deep Blanking Tool

Here is another example of how Danly Precision Die Sets help maintain accurate punch and die relationship on high production work. The part illustrated, a slide cover, is produced at a rate of 120 pieces per minute on the 11-station progressive die and a Danly Standard Precision Semi-Steel Die Set.

An unusual deep blanking tool used in the last station requires precision guiding by the Danly Die Set to prevent breakdowns and assure peak performance. The blanking punch at this station enters the die a distance of 5/16".

Sequence of Operations

Brass coil stock, 3 1/2" wide x .018" thick, is automatically fed through the following operations: Pierce pilot hole, slit, first form, idle, draw shape, pilot, restrike shape, pierce, idle, blank, pilot in scrap.

To date, over 3,000,000 pieces have been produced with the same Danly Die Set. An average of 200,000 pieces per grind is obtained.

Helpful Engineering Service — For helpful engineering service on die sets of any size, standard or special, for any type of press operation, consult Danly without obligation.

get this free bulletin

Illustrates how Danly special machining and welding facilities help you save time and money on special die set applications.



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25 YEARS OF DEPENDABLE SERVICE
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PRECISION DIE SETS, STANDARD AND SPECIAL • MECHANICAL PRESSES AND PRESS EQUIPMENT

*Here's the wrench
Mechanics want!*



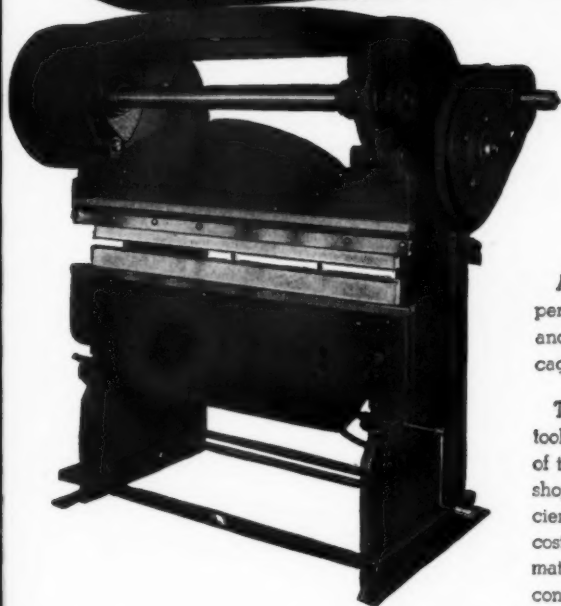
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A POWERFUL, rugged, inexpensive Press Brake, designed and built to the standards of Chicago Steel Forming Presses.

This money-saving production tool will handle 40 to 50 percent of the work done in an average shop. Greater speed, higher efficiency—much lower operating cost—plus the highest quality material and sturdy steel welded construction as in our larger machines.

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with Sealed-In
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This POPE Direct Motorized Cartridge Type Spindle is for users of 6" x 18" Surface Grinders. It produces superior finishes, roughs off surplus metal fast, runs cool and delivers full 1 HP at the wheel.

Bulletin S-2 contains specifications and useful information about this and many other types of Pope Precision Spindles. Write for it.



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is for surface grinders, planers, boring mills and many other machine tools. It comes in sizes from $\frac{3}{4}$ HP to 20 HP and from 900 to 3600 RPM. It is available with flange or tapered nose for quick mounting of wheels or tools.

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Scully-Jones Style "B" Counterbore Driver with interchangeable H.S.S. Cutter and Pilot.



Scully-Jones Adjustable Stop Collar Counterbore Driver, Ball Bearing Type. Also available in Solid Type.

Scully-Jones Style "B" Pilots of high grade steel, hardened and ground.



Scully-Jones Style "B" Counterbore Cutter, Tungsten Carbide Tipped. Also available in High Speed Steel.

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Save Set-Up Time—You can quickly—easily insert and eject these Counterbores and Countersinks because of their simple Stub Taper Shanks.

Maintain Precision Tolerances: Have Fewer Rejects—You can machine pieces to close tolerances and get the finish required by using Scully-Jones Counterbores and Countersinks because their Stub Taper Drive, designed for maximum rigidity and concentricity, assures a true running cutter.

Keep Inventory Low: Meet Production Requirements—Because we can fill your orders immediately from stock of all popular styles and sizes.

Increase Output—You will have less "down" time; your machines will stay on the job longer—turn out more products with these tools—because they are built to our high quality specifications, from carefully selected steels or alloys, designed to stand up under today's high speed production methods.

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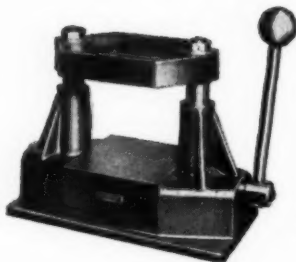


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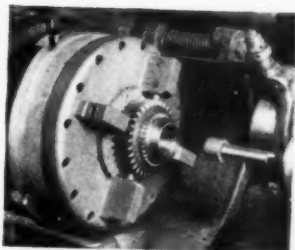


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... for efficient and economical sharpening of single-point tools... carbide, stainless-steel and high speed steel



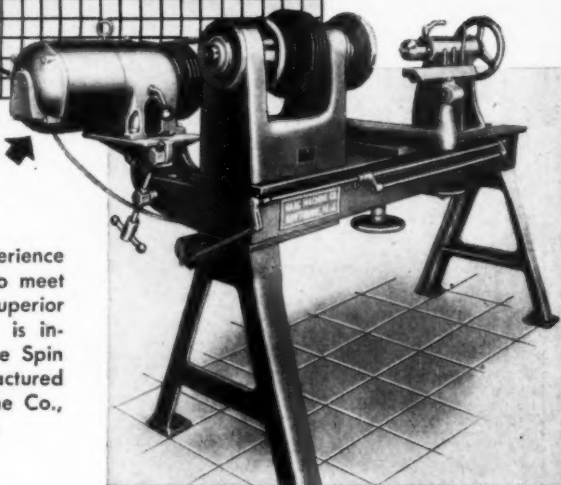
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Barker

Two-Jaw or Three-Jaw WRENCHLESS CHUCK

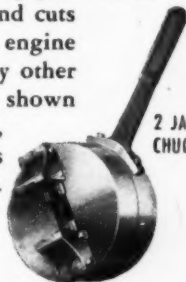
will pay for itself in 60 to 90 days on production schedules by giving MORE parts per hour at a LOWER cost per part. Most round parts can be set in the Barker Wrenchless Chuck without stopping the machine. It saves time, helps speed up production, is simple to operate, reduces operator fatigue and cuts spoilage where the run is continuous on turrets, engine lathes, cutting off machines, drill presses or any other type of chucking machine. The Barker Chuck shown above, replacing an ordinary 3-jaw chuck, jumped production from 18 to 24 pieces per hour. It can do it in *your* plant too. Let us show you how!

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CHUCK



Write for bulletin 201 today.

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ARMOURCLAD RESIN FIBRE DISCS

For Faster, More Productive Metalworking

Actual production tests have proved that this new disc *cuts faster*. This greater initial rate of cut lowers production costs, reduces labor costs.

The new Armourclad Resin Fibre Disc cuts *faster longer* because its special resin bond gives better grain adhesion—greater resistance to heat and humidity.

Better for all disc operations, the new Armourclad Resin Fibre Disc gives faster, more productive metal working—is *especially good* for severe grinding jobs.

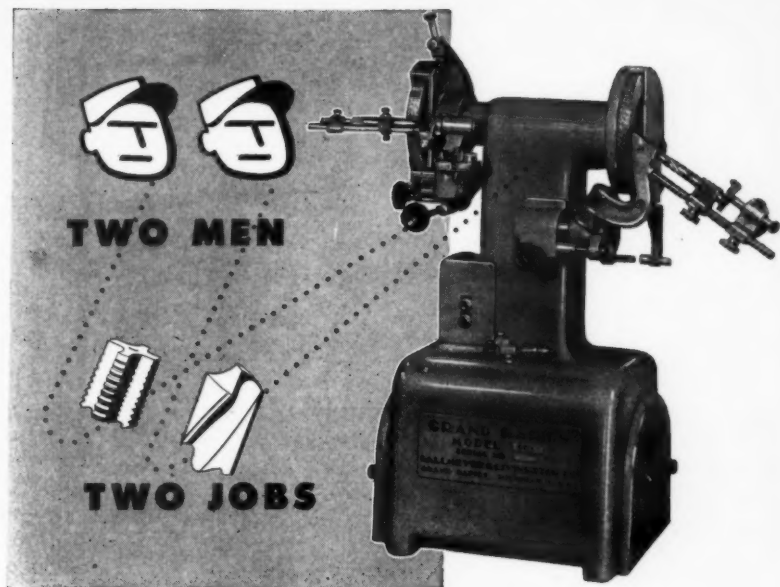
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● Working simultaneously, these men save time, floor space and maintenance costs in your tool room. Providing them with the facilities of two single-purpose machines, the Grand Rapids Tap and Drill Grinder accurately sharpens worn taps and drills to the correct cutting and clearance angles required for precision work. The rigid spindle is ruggedly built to resist heavy combined radial and thrust loads, and large wheel guards and flanges insure maximum safety. Grinding surfaces are dressed by a new, diamond truing device. The long life of this machine is assured by Grand Rapids' widely recognized reputation for sturdy, heavy-duty construction.

To serve you — Your inquiry concerning your specific grinding needs will receive prompt attention.

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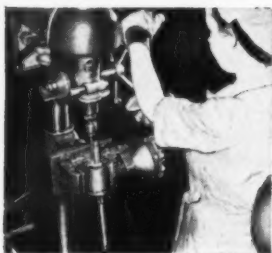
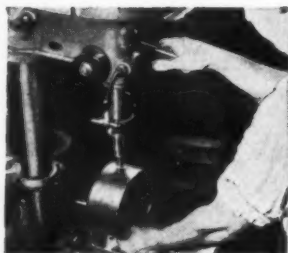
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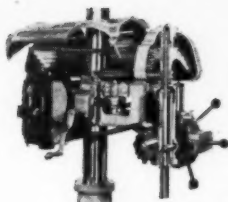


Photo, above right: Turning motor shafts on standard 20" Power Feed Drill Presses.

Photo, upper left: Spinning insulation fibre bushings over steel motor bands with 15" Drill Press.

Photo, lower left: Balancing motor rotors with 15" Drill Press. Depth Gauge Indicator shows amount of metal to be removed for correct dynamic balance.

**Photo, upper right:* 20" Power Feed Drill Head, Model D-1101X. 4 ball bearings, 6" spindle travel. Five standard spindle speeds, 400 to 2600 r.p.m. with 1740 r.p.m. motor. Capacity 1" in cast iron, $\frac{3}{4}$ " in steel. Slo-speed motor optional.



Model D-1101X. Price: less motor and column \$216.00*

TRIPLES PRODUCTION BY TURNING MOTOR SHAFTS WITH WALKER-TURNER 20" POWER FEED DRILL HEADS

Demands for increased production on turning motor and grinder shafts at Kingston-Conley Electric Co., North Plainfield, N. J., necessitated replanning production equipment and methods.

Replacing five lathes with five Walker-Turner 20" Power Feed Drill Presses each equipped with a molybdenum high speed box tool containing three separate bits held with set screws and a Jacobs Chuck on each spindle, *three shaft diameters are now turned in a single operation.* Power feed controls on Drill Heads feed the work into box tools at .003" to .009" per spindle revolution. Accuracy is kept at .004" tolerance. **Results: production tripled; man-hour costs halved.**

Taking further advantage of the broad adaptability of Walker-Turner Machine Tools, Kingston-Conley has set up 15" and 20" Drill Heads with similar ingenuity in other departments of the plant. Increases in production and job efficiency have been equally outstanding.

Variable speeds and methods of mounting and control, plus the ability to work metals, plastics or wood, are the marks of all low-cost Walker-Turner Machine Tools. For complete catalog, write to Walker-Turner Division, Kearney & Trecker Corporation, Plainfield, New Jersey.

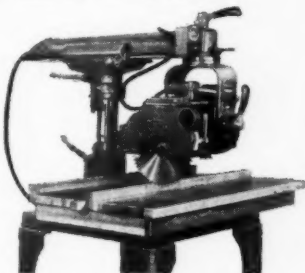
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RADIAL METAL CUT-OFF MACHINES • MOTORS

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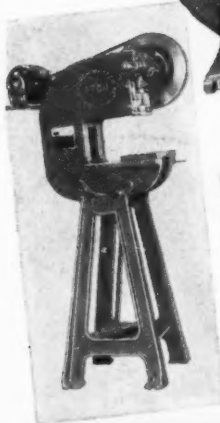
Radial Saw, RA-1108. Gliding ram travels 21½", rips material 38" wide. Universal head tilts for any angle bevel, miter, dado or compound cut—also shaping, tenoning and routing. Change to abrasive wheel, converts for friction metal cutting. Price: with 2 or 3 H.P. motor, less base, \$445.00.

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DEEP THROAT

4TON
punch
press



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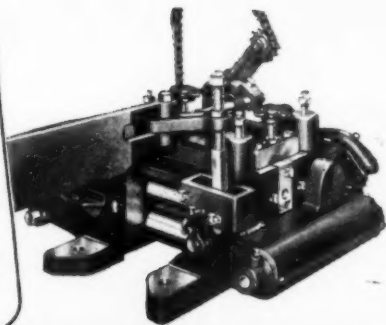
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**Assures Fast
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For All Types of Punch Presses

Wittek Automatic Roll Feeds provide maximum efficiency in the high speed automatic feeding of all types of coiled strip stock to punch presses. Highly flexible in function and application, they are capable of feeding lengths up to 24" per stroke of the press and will handle various stock thicknesses in widths up to the maximum width of the rollers.

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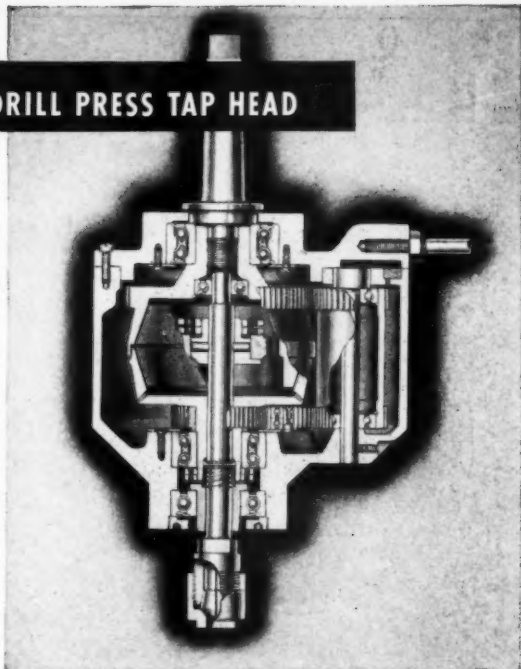
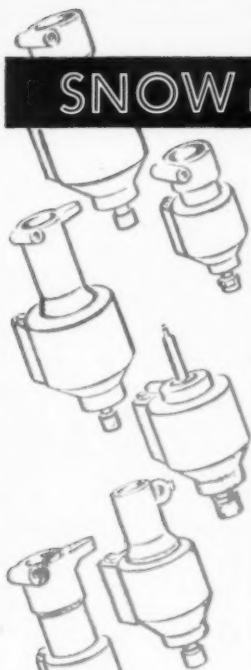
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4305 W. 24th Place, Chicago 23, Illinois

Automatic
ROLL FEEDS
and
REEL STANDS



SNOW DRILL PRESS TAP HEAD



FEATURES:

- Drive shafts hardened and ground.
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- Light weight clutch
- Spindle bushing revolves with bearing.
- No lateral float.
- Collets ground through-out.
- Eight ball bearings.
- 2:1 reverse speed.
- Hardened alloy gears and studs.
- Delivery from stock.

The SNOW Drill Press Tap Head is the same unit as used on the SNOW Full Universal Tapping Machines. It is the only Tap Head designed and manufactured for a machine tool by a machine tool builder.

Engineers and mechanics will recognize the rigid, sturdy construction; and operators will vouch for length of service, ease of operation, and quality of work produced.

Eighteen years of production testing, and thousands of installations have proven the advantages of using a precision built drill press tap head.

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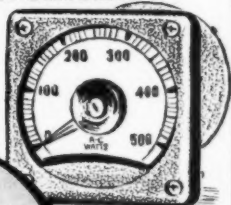
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
Fine Tooth

CIRCLE SAWS Feature:

30 teeth per inch

1" to 6" diameters

Thickness .006 in standard sizes; furnished in .003 up to 1½" diameter as specials.

Throughout American Industry these CIRCLE  SAWS have provided for years the delicate precision necessary for producing fine measuring, indicating and control instruments.

CIRCLE SAWS

The "Standard" of Saw Quality

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*Now a belt that speeds up
stock removal, and
lasts 2 to 4 times longer*

THE **NEW**
RESINALL METALITE*

Here's a cloth backband belt that takes the high heat of fast stock removal, and gives 2 to 4 times the usual dry grinding mileage.

The answer is in the bond — a thermosetting resin that heat cannot weaken, combined with the Behr-Manning patented Durabonded* process which assures extra strength and grain-grip, and retards loading. This heat-proof bond locks every abrasive grain in its original, correct cutting position.

Result: Sustained sharp cutting, 2 to 4 times longer — less down-time for belt changing — higher production and economy all along the line.



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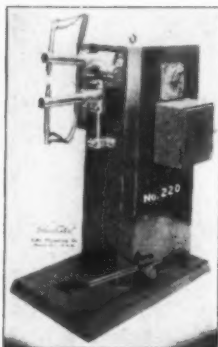
See the new RESINALL METALITE belt do its stuff in your own shop on your own work. Just write us on your letterhead.

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SPOT BUTT GUN ARC WELDERS

WE MANUFACTURE A COMPLETE LINE OF
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FOR ALL TYPES OF WELDING IN SIZES: 1/4 to 300 KVA.
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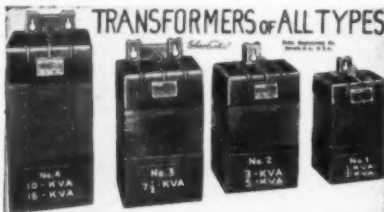


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FOOT, AIR
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NEW GEAR SHAVING MACHINE

Has far greater

Production Possibilities

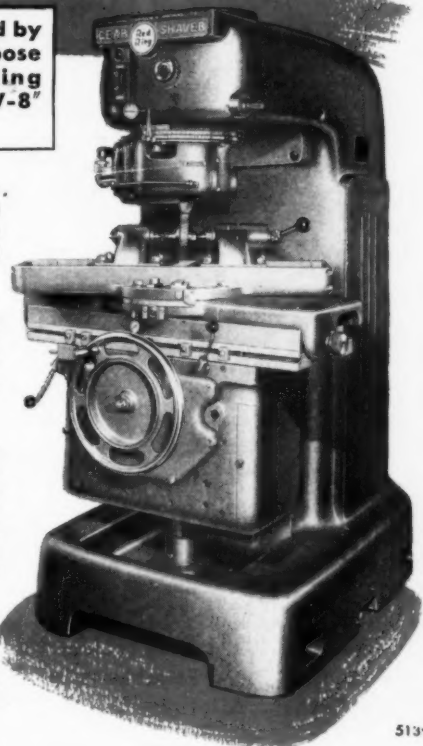
Gears may be shaved by any method you choose on the new Red Ring Universal Model GCV-8" and 12".

Conventional Shaving—You can shave, wide face gears by the conventional method of shaving, that is, when the gear is reciprocated across the cutter and parallel to its axis.

Diagonal Shaving—Or, you can shave the narrower face gears diagonally at much higher production rates and with considerably less cutter wear and less effort by the operator.

Elliptoid Tooth Form—You can give the gear teeth the perfect Elliptoid form (crowning by rocking the table) while they are being shaved by either method mentioned above and without the necessity of using specially formed cutters. Special cutters may be used, however, if desired.

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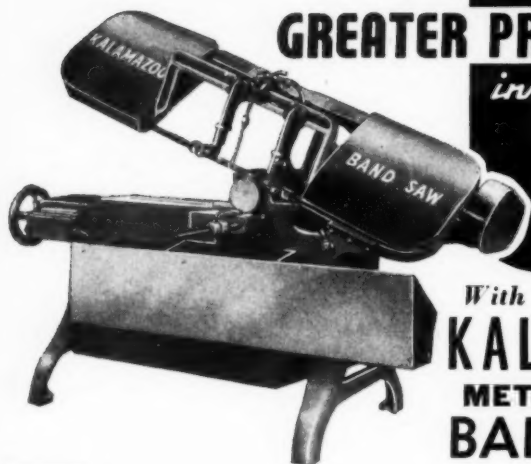


Write for descriptive bulletin giving all the details of the new Red Ring Universal and its operation.

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**LOWER
COSTS**

With the

**KALAMAZOO
METAL-CUTTING
BAND SAW**

When you have a big job of cutting whether it is bars, angles, channels, tubes or odd shapes it is almost certain that the Kalamazoo Band Saw can do it for you **FASTER** and more accurately.

The amazing production is due to continuous cutting action, quick set-up and high speed.

The coolant model (illustrated) is ideal for continuous production. Without the coolant it is a big time and labor saver on short runs. Portable—plugs in anywhere. Automatic in operation. A lot of production for a small investment.

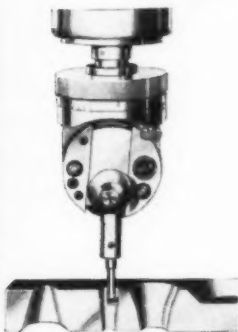
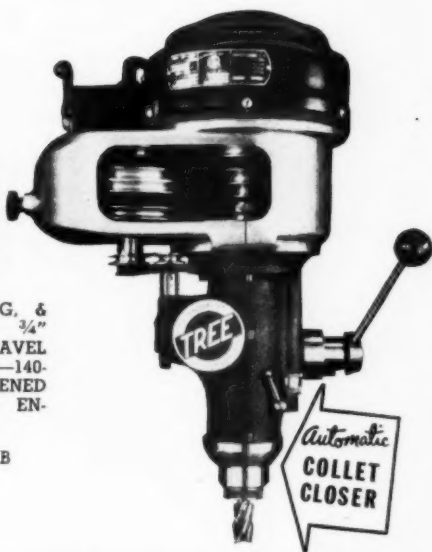
MACHINE TOOL DIVISION
KALAMAZOO TANK & SILO COMPANY
KALAMAZOO 16, MICHIGAN

***SPEED UP* TOOL WORK!**

with the
TREE
**UNIVERSAL
MILLING
ATTACHMENT**

- ALL ANGLE MILLING, DRILLING, & BORING • COMPACT DESIGN • $\frac{3}{4}$ " COLLET CAPACITY • 4" QUILL TRAVEL • POWER FEED • EIGHT SPEEDS—140-3500RPM or 210-5200RPM • HARDENED & GROUND SPINDLE & QUILL • ENCLOSED MICROMETER DEPTH STOP

For Full Information—Write Dept. B




CUT COST OF TAPER HOLES WITH THE TREE TAPER BORING TOOL . . .

Here's a revolutionary boring tool for the milling machine, jig borer and boring bar — that not only bores taper holes, but can also be used for facing, straight boring and outside turning. . . .

Write Dept. B

TREE TOOL AND DIE WORKS
1600 JUNCTION AVENUE RACINE, WISCONSIN



Westinghouse says a good word for **IDEAL** **LIVE CENTERS**

... in the words of G. Young,
tool supervisor at the Nuttall Plant of
Westinghouse Electric Corp.,
Pittsburgh: "Since installing Ideal
Live Centers we have had no 'down'
time due to center wear."

What happened at Westinghouse is a typical case history. When they switch to Ideal Live Centers, users save from 20 to 50% and raise the quantity and quality of lathe output. They get deeper cuts at higher speeds with no burning of work or center. There's no friction—no grabbing—no gouging—no time loss on lubricating and grinding—less spoilage—more profit per man hour!

The Ideal "Multi-Duty" Live Center is available from stock with male, female, and pipe type inserts; also Heavy Duty Live Center, built to carry heavy loads—accurate to .0005. Ask for information and free demonstration today. **IDEAL INDUSTRIES, Inc., Sycamore, Ill.**



Lawrence G. Long, Westinghouse machinist, turning 10" bar F5 #3848 with Ideal Live Center. Feed is .022 @ 200'/min. Tool is Kennametal.

Distributed Through

AMERICA'S LEADING WHOLESALERS

Canadian Distributor: Irving Smith, Ltd., Montreal

P&J

AUTOMATIC

Turret Lathes

3U (SPEED-FLEX)



For high speed machining of small castings and forgings up to 6" in diameter, the P&J 3U Speed-Flex Automatic Turret Lathe provides the most effective answer . . . in fact the machine was developed to meet these specific needs. Here is a turret lathe that is fully automatic except, of course, for the checking of work and

removal of the finished job. Four, yes 4, automatic changes of spindle speed and three automatic feed changes are available. You'll want to learn more about the 3U Speed-Flex that requires only 16 square feet of floor space, so write today for the informative bulletin.

SPECIFICATIONS IN BRIEF

Standard Spindle Speed Range: 73 to 1445 RPM

Optional Spindle Speed Range: 36 to 711 - 73 to 1445 RPM

6 Faces on turret.

Total turret slide travel: 6"

Cross slide travel 2½" front 2¾" rear

Net Weight: 5000 lbs.

Pawtucket, Rhode Island.....

**POTTER &
JOHNSTON
MACHINE CO.**

BUILT RIGHT! PRICED RIGHT!

GREAVES
No. 2-H
MILLING MACHINE
PLAIN OR
UNIVERSAL



Simple in design. Easy to operate. Rigid construction including every worthwhile modern feature of milling machine development. With 18 spindle speeds (20 to 1000 R.P.M.) both the universal and plain millers are readily adaptable for heavy duty or light precision production work. Send for bulletin.

**DEALER
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AVAILABLE**

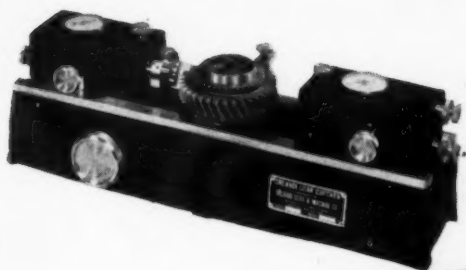
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complete details



Greaves MACHINE TOOL CO.

N-2013 EASTERN AVENUE CINCINNATI 2, OHIO





*The Universal
fixture that
quickly—*

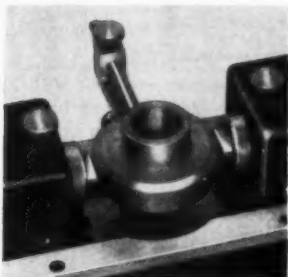
CHECKS GEARS and BLANKS WITHOUT CENTERS or ARBORS—

THE
ORLANDI ★

UP TO 8" DIAMETERS ON
MODEL 100 OR 101.
LARGER ON SPECIALS.

•
NO MASTER GEARS
NEEDED

•
CHECKS P.D. WITH
PINS OR BALLS



Will Check						
	O.D.	PITCH DIAM.	CONCENTRICITY	TOOTH SPACING	BACK-LASH	PARALLELISM
BLANKS						
Gears and Worm	★		★			★
CLUSTER Gears	★	★	★	★	★	★
SPUR Gears	★	★	★	★	★	★
HELICALS	★	★	★	★	★	★
WORM Gears	★	★	★			
PLUG GAGES and ARBORS	★					
THREADS and Worms		★				

For complete information
ask for Bulletin

Sold exclusively by

MICHIGAN TOOL CO.

7171 E. McNichols Road

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DRIVE DOWN COSTS!

Staples CARBIDE-TIPPED **EXPANSION REAMERS**

The only expansion reamer with a solid tool body—not split—which provides rigidity and accuracy not obtained in conventional types.

To compensate for tool wear, simply drive in the tapered plug, and expand tool back to original diameter. Plug causes the arcs of the body between the cutting blades to flatten, tilts the tips back, and automatically increases the clearance angle. Expansion plug contacts tool body well beyond rear of tips, assuring uniform parallel expansion the full tip length. Cutting blades remain perfectly concentric.

Range of expansion is from .004" to .020", depending on tool size and number of flutes. Plug has taper of .020" per inch, permitting easy adjustment of tool to .0001". Staples Expansion Reamers can be expanded several times without a regrind, and without affecting hole finish.

Put these standard tools into your production now—watch your reamer costs go down on highly accurate hole finishing operations.

THE STAPLES TOOL CO., CINCINNATI 25, OHIO • DISTRIBUTORS IN MAJOR CITIES



STANDARD STAPLES EXPANSION REAMERS
SOFT SHANK AND FLUTES
—For drill press, lathe and screw machine applications where guide bushings are not used.
HARDENED SHANK AND FLUTES
—For all types of reaming through guide bushings.
Straight Flutes — Straight and Taper Shanks from 1/4" to 1 1/2" diameter.

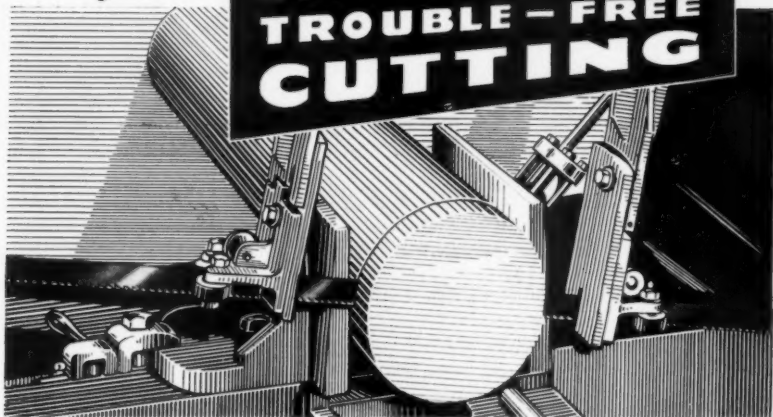
Staples CARBIDE-TIPPED CUTTING TOOLS

A COMPLETE LINE OF SINGLE AND MULTIPLE POINT CUTTING TOOLS
EXPANSION REAMERS • FORM TOOLS • CENTERS • MASONRY DRILLS • SPECIAL TOOLS

BARNES BAND SAWS

for

**SMOOTH, EASY and
TROUBLE-FREE
CUTTING**



Production men have found by experience that one way to help eliminate troublesome blade failures and frequent blade changes on band saw machines is to apply Barnes blades. These are the blades that cut with greater efficiency even at standard speeds and feeds . . . that don't have to be overloaded to accelerate production or cut particularly tough metals.

Let Barnes band saw blades . . . noted for their smoother, easier cutting and trouble-free, economical performance . . . prove their qualities on your band saw operations. Check your needs with your Barnes Distributor who carries a complete line for every metal cutting requirement.

BARNES BAND SAW BLADES

- **HARD EDGE FLEXIBLE BACK**
... for general all-purpose cutting
- **ARC-LINE**
... for all contour, die-cutting and similar applications
- **SKIP-TOOTH**
... for high-speed sawing of soft non-ferrous alloys, plastic, fibre, etc.
- **SPRING-TEMPER**
... for thin sheet metal, tubing, etc.

The Barnes "Handbook of Metal Sawing" will help you get maximum efficiency from your band saw. Write on your letterhead for your free copy.



Established
1919

W. D. BARNES CO., INC.

1297 TERMINAL AVE.

DETROIT 14, MICH.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

Why "Blu-Flex?"[®]

Aren't other high-speed blades doing a job?



You *know* the job a good, all-hard, high-speed hand blade does. Gives you fast, clean cuts . . . at low cost. There's just one catch: too much breakage. Any warping, twisting or snagging is likely to cost you a blade long before it's worn out. (Snapping blades endanger the worker, too.)

"Blu-Flex" *eliminates* breakage, insures your getting maximum cutting value out of every blade you buy. Its teeth are hard—*very* hard—blended into a *soft* back that absorbs the shock and abuse a blade gets even in ordinary use. An entirely new heat-treating process is behind this remarkable blade, makes it almost impossible for you to strip out teeth.

Your Millers Falls hacksaw blade distributor will tell you why . . . and better still, *show you why*. Ask for a demonstration. Millers Falls Company, Greenfield, Mass.



What's this! It looks like a battered old blade. Actually, it's a new "Blu-Flex." We deliberately tortured it to show you its extreme flexibility and freedom from breakage. Then we straightened it, put it in a frame, and did a lot of useful cutting with it. *That's* "Blu-Flex" for you! *Truly* flexible . . . practically unbreakable . . . and with sharp teeth that stay sharp.

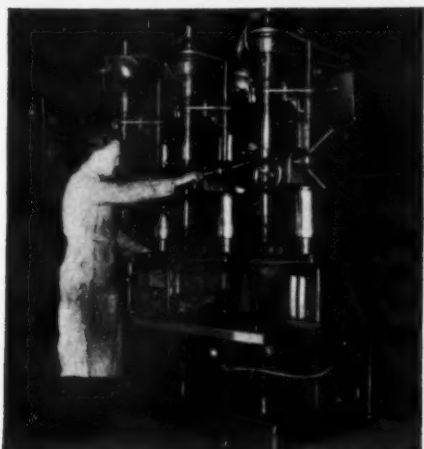


It's New!

It's "Blu-Flex!"

It's Millers Falls!

FOR LOWER MANUFACTURING COSTS



"BUFFALO" No. 22 3-SPINDLE DRILL

Slashing Time and Costs **on the BIG JOBS**

Up to 2" holes in cast iron, 1 1/4" holes in steel. This "Buffalo" No. 22 Drill is cutting costs! It's a BIG drill—97" high with a 1.312" spindle—yet all controls are easy to handle, setup and speed adjustments readily made for drilling or tapping. Write for Bulletin 2989-E—see what a JOB the "22" can do for you!

BUFFALO FORGE
COMPANY

161 MORTIMER ST.

BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



- ★ BACK SPOT FACERS
- ★ BAR CUTTERS
- ★ BENDING ROLLS
- ★ BILLET SHEARS
- ★ DOUBLE END PUNCHES AND SHEARS
- ★ LOCOMOTIVE SHEARS
- ★ MILL TYPE SHEARS
- ★ RAPID ACTING PUNCHES
- ★ SINGLE END SHEARS
- ★ SPRUE CUTTERS
- ★ STRUCTURAL IRON WORKERS
- ★ UNIVERSAL IRON WORKERS
- ★ DRILLS FOR THE PRODUCTION LINE—DRILLS FOR THE TOOL ROOM

CONTINUOUS SERVICE FASTER OPERATION—PEAK ACCURACY

WHYTE

ENGINEERING CO.

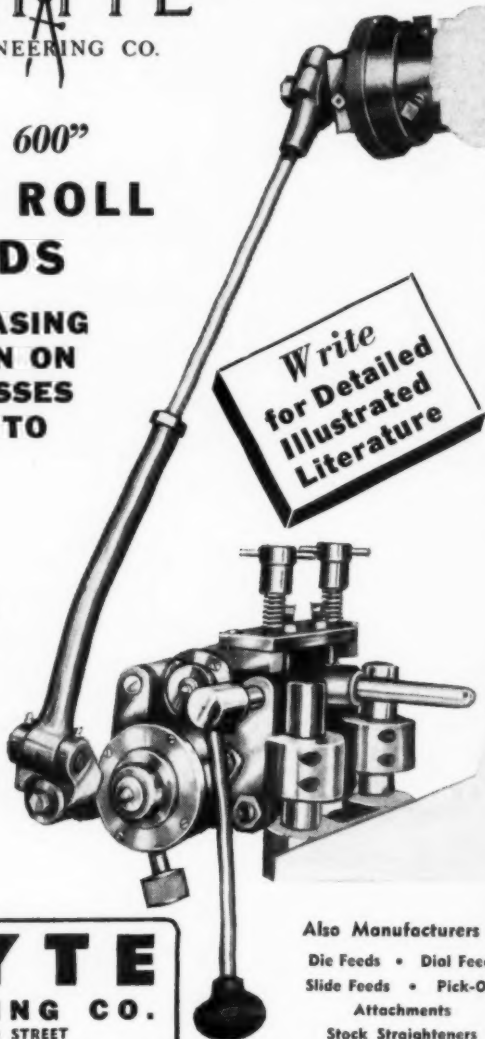
"Series 600"

WHITE ROLL FEEDS

**FOR INCREASING
PRODUCTION ON
PUNCH PRESSES
FOR YEARS TO
COME!**

★
**KEEP
PACE WITH
PROGRESS!
GET THE
FACTS
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WHYTE
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185 ROWLAND STREET
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Also Manufacturers of
Die Feeds • Dial Feeds
Slide Feeds • Pick-Off
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Stock Straighteners
Lamination Dies

DoALL
No. 123, 124, 125

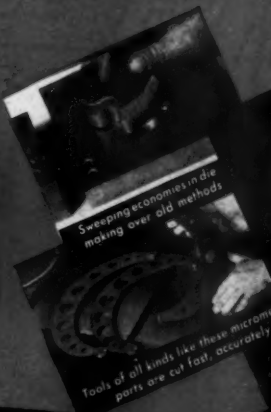
Contour Sawing

INDUSTRY'S MULTI-PURPOSE PROCESS
FOR FASTER LOW-COST PRODUCTION
... FOR CUTTING ALL MATERIALS



19 Models

Contour Sawing saves industry thousands of man-hours every day. It differs from other machine-tool processes in that it does not waste time "whittling" stock to shape but *slices* off unneeded parts—even hard alloys and tungsten carbide. Makes internal or external, curved or straight cuts at any angle. Operators trained in few days—do not need years of machinists' experience. With many special blades and infinitely variable speeds, *Contour Sawing* cuts anything and makes amazing production economies in all industries. Ask about the special DoALL customer research service, free movie for industrial groups, schools, etc.

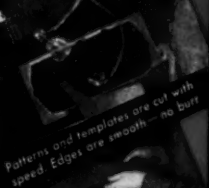


Sweeping economies in die making over old methods

Tools of all kinds like these micrometer parts are cut fast, accurately



Shape-cutting "castings" and "forgings" from ordinary stock materials



Patterns and templates are cut with speed. Edges are smooth—no burr



Jigs and fixtures, sawed and welded, eliminate machine time



Pipe, tubing, structural iron, etc., is sawed at any curve and angle



Stampings made by stock-sawing. There's no cost of punches and dies

Contour sawing is ideal for making countless production parts

The DoALL Company
No. 123, 124, 125

REPRESENTATIVES
IN 36 COUNTRIES



Des Plaines, Illinois
Circle Address: DoALL, Des Plaines

DoALL STORES
IN KEY CITIES

Blades for Every Purpose

Iron	Steel	Copper	Brass	Alum
Forgings	Stainless steel	Tools	Tungsten carbide	Machine parts
Castings	Heat-treated steel	Alloys	Wood	
Plastics	Laminates	Hard-pressed	Glass	
		Cloth	Ceramics	

DIAMOND TOOTH
SPRAT EDGE
SKIP TOOTH
FRICION SAW
CLAW
BUTTRISS
PRECISION

from FLAT SURFACES

TO INTRICATE SHAPES

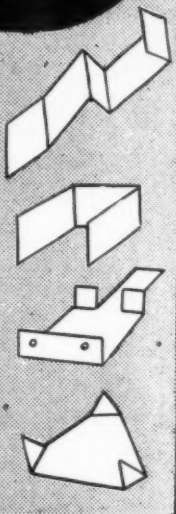


with the New
**DI-ACRO
BRAKE**

- **ROK-LOK**—new sensitive material clamp increases accuracy
- **DOUBLE-EDGED FORMING BLADE** allows close reverse bends
- **NEW PRECISION STOPS** accurately control angularity of bends

This versatile metal forming machine was developed for use in model shops, experimental laboratories and production departments where it often replaces dies for all types of precision forming operations. Di-Acro Brakes will form a great variety of materials including copper, bronze, stainless steel, aluminum and bi-metals.

WRITE FOR CATALOG. New edition of 40-page Di-Acro Catalog contains detailed information on all Di-Acro Brakes, Shears, and Benders and illustrates how these precision machines can be used individually or cooperatively for "DIE-LESS DUPLICATING".



◀ DI-ACRO is Pronounced "Die-Ack-Ro" ▶



O'NEIL-IRWIN MFG. CO.

314 8TH AVE., LAKE CITY, MINNESOTA

NEW THREADWELL GAGE LINE

ECONOMY AND SATISFACTION GUARANTEED.=



*Threadwell Gages are now
available to industry thru
Threadwell Authorized Distributors.
For Catalog and name of nearest
Threadwell Distributor, write to
Threadwell Tap and Die Company,
Greenfield, Massachusetts.*

Threadwell

"TOOLS OF DISTINCTION"

THREADWELL TAP AND DIE COMPANY

Makers of Threadwell Taps, Dies, Counterbores, Twist Drills, Keyway
Broaches, Self-Oiling Pipe Threader and other fine cutting tools.

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95

MAKE 1 TAP

DO THE WORK OF 6

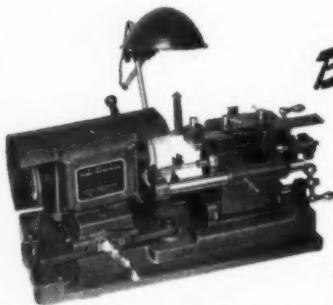
with

Blake

TAP GRINDERS

Users everywhere report increased tap life of 600% and more when Blake Tap Grinders are on the job. (One large user actually reground a single tap 32 times!) Actual tests show that after each grinding both chamfer and relief equal or surpass original tap for accuracy and uniformity. And that's not all — set-ups on Blake Tap Grinders are virtually foolproof, allow little chance for error . . . *even unskilled help can grind an average tap accurately in less than one minute.*

The answer to economical tapping is the Blake Tap Grinder. Get complete details by sending for free illustrated bulletin — fill out and mail coupon today!



PICK THE MODEL

Best FOR YOUR SHOP!

No. 1 for taps up to 6" long;
No. 2 for taps up to 14". Both
models grind right or left hand
taps with 2, 3, 4, 5, 6, 8 or 10
flutes in sizes from No. 0 to 2½"
Choice of three mounting methods:
on centers, on shank, or on thread.

EDWARD

Blake

COMPANY

437 Cherry St.

West Newton 65, Mass.

Please send me complete details on
The Blake Tap Grinder

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____

Blake Tap Grinders — Blake Flute Grinder
American Tool Holders — Black Diamond
Precision Drill Grinders — Waltham Cutter
Sharpeners — Waltham Thread Millers
Surface Finish Standards.



IT TAKES SOMETHING EXTRA TO BE A *Specialist!*

The railroad engineer is a specialist, trained by years of apprenticeship to accept one outstanding qualification—that of personal responsibility.

The Bath organization recognizes its responsibility to industry by maintaining high standards of quality throughout the step-by-step production of ground thread taps.

The selection of steel, the grinding of threads from the solid AFTER hardening, the accurate adherence to specifications and a rigid system of inspection, guarantee the uniform quality of Bath stock and the special size ground thread taps. Years of apprenticeship have produced experienced Bath craftsmen, ready to help with your tap problems. We invite your inquiry—see your Bath representative or write us direct.

(Transportation is paid to your plant on all Bath products)

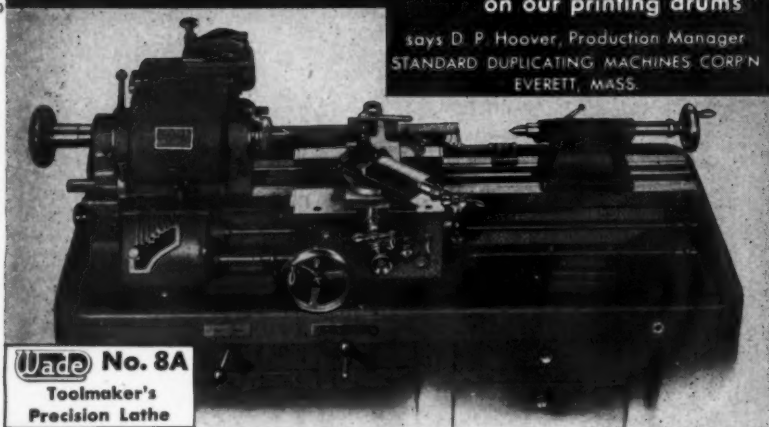
JOHN BATH CO. INCORPORATED

14 Grafton Street
WORCESTER 8, MASS.

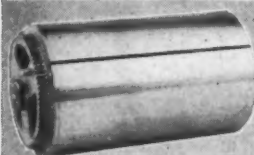
GROUND THREAD TAPS • PLUG AND RING TAPS • INTERNAL MICROMETERS

"Because it gives us
smooth finish and dimensional accuracy
on our printing drums"

says D. P. Hoover, Production Manager
STANDARD DUPLICATING MACHINES CORP.
EVERETT, MASS.



Wade No. 8A
Toolmaker's
Precision Lathe



We had asked Mr. Hoover to tell us *just why* he preferred the Wade No. 8A Toolmaker's Precision Lathe for the finish operation on this drum. (He uses a less expensive, less accurate lathe of another make for roughing.) He told us that the 8A lathe has the *speed* and *ruggedness* he needs for high production output and a smooth surface, using tungsten carbide tools; and it has the *precision* that he demands for his final O.D., held to a tolerance of $\pm .002"$, and made possible through the rigidity of the spindle and the power of the drive.

One of the secrets of good printing reproduction on this low-priced fluid duplicator known as Model SWA is the great care used in casting and machining the zinc printing drum. This very efficient Standard Duplicator would fall far short of perfection with a poor drum, and we are proud that our No. 8A lathe is helping to maintain quality and speed up production at the Standard plant.

SPECIFICATIONS

Swing over Bed	8 1/2"
Distance between Centers	24"
Collet Capacity	1"
Taper Standard for Centers	No. 2 Morse
Tailstock Spindle Travel	3 1/4"
Tool Shank Section	2 1/2" x 3/4"

Write today for illustrated folder describing this very desirable
Toolmaker's Lathe and its accessories

THE WADE TOOL CO., 51 RIVER ST., WALTHAM 54, MASS.

This is another example of how you can
WADE into your work with a **Wade**

NEW, TYPE-DX

HEAVY DUTY

Shoplifter

Two Capacities

2000 lbs. and 1000 lbs.

A larger, huskier version of the popular Type D 500 lb. Shoplifter, but retaining the easy handling features of the smaller lifter. Platform and base frame have an overall width of 24" that allows easy passage in narrow aisles, between presses, and through doorways. Hoisting unit is ball bearing equipped. Automatic friction-disc brake holds load at any point, not necessary to set or release pawl or brake device. Only 20 lbs. pressure is required on crank handle to raise or lower load. Extra heavy construction gives rigid stability that enables the operator to handle maximum loads with ease and smoothness. No other lifter of equal capacity on the market can match the Shoplifter for value. One user said: "It's a lot of machine for the money."

SPECIFICATIONS

CAPACITY—1000 lbs. and 2000 lbs.

OVERALL HEIGHT (to clear)—6'8".

PLATFORM LIFT—54".

PLATFORM PLATE—24" wide x 27½" long (30" out from uprights).

BASEFRAME—24" wide x 50½" long overall. Open end front.

BASE WHEELS—5" fixed wheels, 6" swivel casters with push bar steer.

HOIST UNIT (two capacities)—Ball bearing equipped, crank up and down action, automatic safety brake holds load at whatever point raised. Drum scored for cable.

PAINTED—Standard olive green finish.

PRICE—1000 lb. capacity.....\$320.00

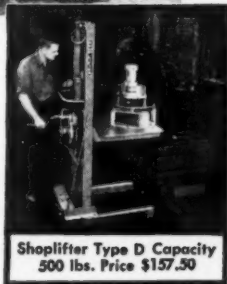
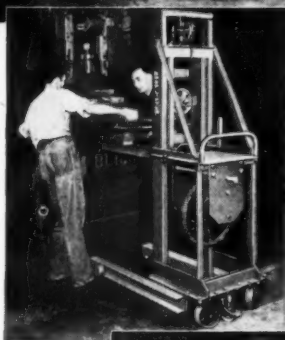
2000 lb. capacity.....\$370.00

f.o.b. Chicago, freight prepaid to any destination in U.S.

Heavy duty foot operated floor lock.....\$15.00 Extra

ECONOMY ENGINEERING CO.

4505 W. Lake Street, Chicago 24, Illinois



Shoplifter Type D Capacity
500 lbs. Price \$157.50

SUTTON

SIGNIFIES
SUPERIOR SERVICE
IN
COLLETS and FEEDERS



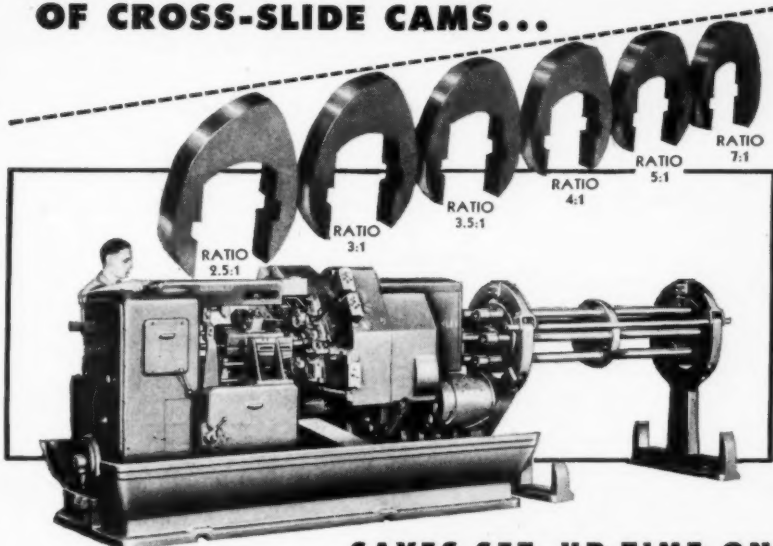
- Supplies quickly and accurately quality collets and feeders that meet your requirements.
- Makes standard and special collets and feeders for all automatics, lathes and milling machines.
- Features diamond serrated collets that grip tighter with less tension — are self-cleaning — reduce spoilage.

"Only Sutton Collets are Diamond Serrated"

SUTTON TOOL COMPANY
STURGIS, MICHIGAN

SUTTON COLLETS

UNIFORM HIGH POINT OF CROSS-SLIDE CAMS...



... SAVES SET-UP TIME ON GREENLEE "6" AUTOMATIC SCREW MACHINE

No matter what ratio cross-slide cam you select, the high point is always the same distance from the center of the cam shaft. This means that cams can be changed at will after cross-slide feed adjustments have been made *without having to re-adjust tools or holders*. When trying out a set-up for best rates of cross feeds, this GREENLEE feature provides an obvious and substantial saving in time.

COMPENSATING STOPS SET AT FACTORY AND SELDOM NEED RESETTING

Compensating wheels (see above) carry adjustable hardened steel stop buttons and index in unison with the spindle carrier. Each button is locked to limit the travel of a given cross-slide to correspond with spindle position. All buttons are set at the factory and seldom require adjustment. This GREENLEE feature insures accuracy and uniform production at all spindle positions.

CROSS-SLIDES INDEPENDENTLY OPERATED

On the GREENLEE "6", each cross-slide has its own individual feed cam, so the feed rate of each slide can be set independently of any other. This affords maximum set-up flexibility, and permits selection of the best feed rate for each cross-slide tool. Cams are

standardized and designed to provide a range of cross feed rates which are in simple fractional relation to the main tool slide feed rate. Cams are fully interchangeable—any cross-slide cam can be used on any cross-slide—thus effecting a substantial saving in cam expense.

Send for Literature

Write today for Booklet and Circular giving full information on all GREENLEE features and describing the advantages of the new Lead-Screw Feed for heavy-duty precision threading. Learn why the Greenlee "6" is often called "The Operator's Favorite".



GREENLEE BROS. & CO., 1840 MASON AVE., ROCKFORD, ILLINOIS

MULTIPLE SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

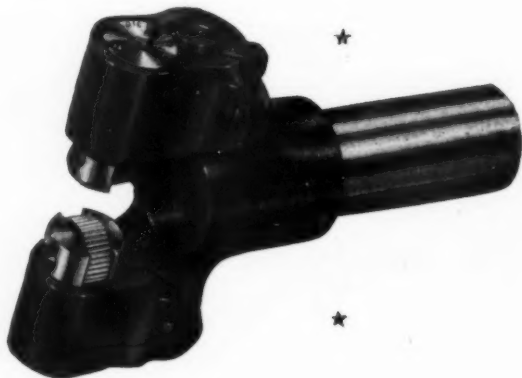
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101

NEW!

R
AND
L

★
**KNURLING
TOOL**
★



New streamlined design has half the weight of existing tools of comparable size, affords better grip and control of knurling tools. Lock screw is located on the outside of the tool, easily accessible for rapid, accurate adjustment. Screw is longer, and will not work loose. Available in a complete range of sizes to fit all R & L Tools.

WRITE FOR COMPLETE DETAILS

R AND L TOOLS

1825 BRISTOL ST., NICETOWN, PHILADELPHIA 40, PA.

THRIFTMASTER

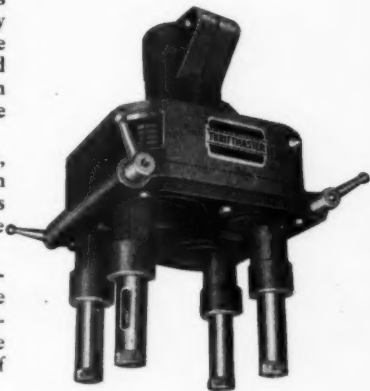
Invites Comparison

WHEN you investigate multiple spindle drillheads as a means of saving multiple man-hours in production, you'll select the head which carries the highest capacity rating in the materials you process. Be sure to demand a *guarantee* of life expectancy of the tool based on that rated capacity.

Thriftmaster drillheads are rated at the full capacity of the tool *in steel—using power feed*. You'll find the basic design right—construction rugged—gears, spindles, bearings and chucks of the finest quality steel to withstand the severe abuse of heavy production. You'll find Thriftmaster has a reputation for exceeding its performance warranty.

When you install Thriftmaster, you know it will produce precision work at peak output, with costs pared down to a profitable minimum.

When you operate Thriftmaster—either two, three or four-spindle Adjustable or six spindle Universal Joint type head—you will be convinced, beyond any doubt, of Thriftmaster superiority.



For complete information, write to: Engineering Department,
Thriftmaster Products Corp., 1048 N. Plum St., Lancaster, Pa.

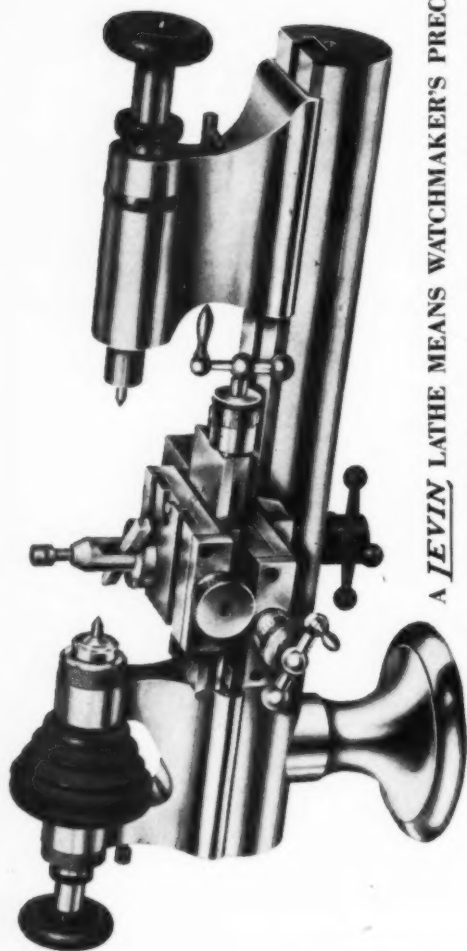
Detroit (21) E. B. Parish Company
Pittsburgh (3) Voss Machinery Co.
Chicago (7) Gatz-Arnold Company
Cleveland (12) T. J. Fraser Tool Supply Co.

Boston (16) A. R. Shevlin Company
Philadelphia (40) Wright and Gade Tool Co.
Indianapolis, R. L. Guimont Co.
Cleveland (12) T. J. Fraser Tool Supply Co.

THRIFTMASTER

Multiple Spindle Drillheads

FIXED AND ADJUSTABLE CENTERS



A LEVIN LATHE MEANS WATCHMAKER'S PRECISION

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MOTOR ½ H.P. A.C., or D.C.

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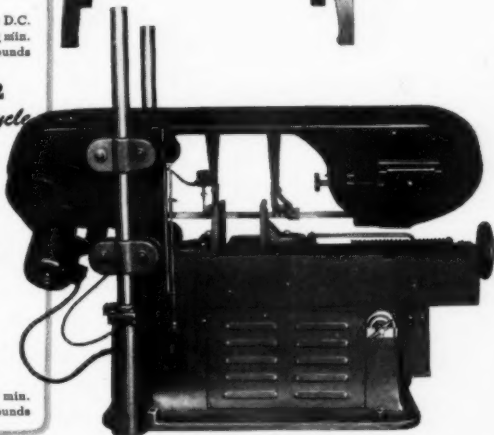
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Rounds 12¾" O.D.

MOTORS ¾ H.P. and ½ H.P.

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WEIGHT Approximately 1750 pounds



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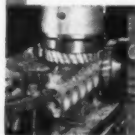
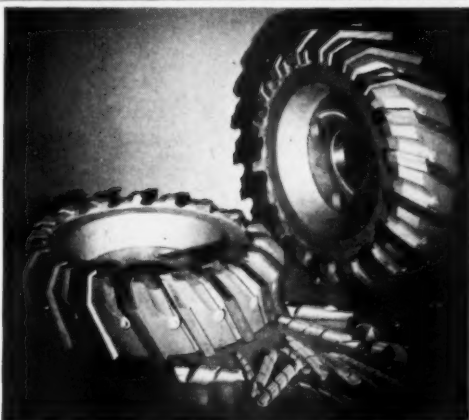
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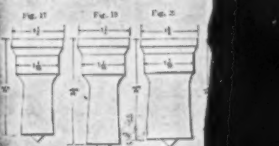


Fig.	Diameter	Fig.	Diameter
1	1/2"	11	1 1/2"
2	3/4"	12	2"
3	1"	13	2 1/2"
4	1 1/4"	14	3"
5	1 1/2"	15	3 1/2"
6	1 3/4"	16	4"
7	2"	17	4 1/2"
8	2 1/4"	18	5"
9	2 1/2"	19	5 1/2"
10	3"	20	6"

Page 124



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Featured in this issue

STREAMLINED PRODUCTION FLOW AT BUSH MFG. CO., by Gerald Eldridge Stedman. Our peregrinating contributing editor, Gerry Stedman stopped at Bush Mfg. Co. in West Hartford, Conn., for an extremely interesting article describing the manufacture of condensers. Many novel tooling ideas are employed by this company. Conveyors are used throughout the plant to facilitate the flow of production through the plant. Page...115

ELECTRONIC LATHE CONTROLS RESULT IN SMOOTH OPERATION, SENSITIVITY, QUICK RESPONSE, by Kermit K. Kuck. Electronic controls on machine tools have interested the industry for some time. Unfortunately, their cost and bulk have restricted their full use. The Monarch Machine Tool Company's use of electronic controls is, therefore, well worth close study. They have not only reduced the electronic unit in bulk, but are also directing their attention to the problem of cost. Page123

HARD METAL CARBIDES PROVE THEIR VERSATILITY, by J. S. Gillespie. The use of carbides as cutting tools is well known, but their application to other uses may come as a surprise. The scope of carbide applications is constantly expanding. A few of more recent and interesting applications are discussed by the author. Page137

LETTER FROM LONDON. Mr. Hutcheson, in this letter, draws our attention to the Machine Tool Exhibition which was held in London. Page157

NMTBA SALES REFRESHER COURSE, LECTURE 2, WHO INFLUENCES MACHINE TOOL PURCHASES? by E. J. Seifreat. One of the questions most frequently

asked is, who makes machine tool buying decisions. In this lecture Mr. Seifreat, president of The Seifreat-Elstad Machinery Co. endeavors to supply an answer to this problem. How important is the purchasing department in approving the purchases of new tools? Should a canned sales talk be used? Page...163

NMTBA SALES REFRESHER COURSE, LECTURE 3. HOW TO UNDERSTAND YOUR CUSTOMER, by Dr. A. L. Winsor. As head of the School of Education, Cornell University, Dr. Winsor knows quite a bit about psychology and its application in sales efforts. Some of the mental nuts and bolts of the buyers' minds are examined. Through an intelligent application of common-sense psychology sales men can increase their sales. Page181

WHAT'S NEW IN METALWORKING. Page199

SHOP HINTS. Page310

AVAILABLE LITERATURE. Page315

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METAL SHOW EXHIBITORS, Page326

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PRODUCTS INDEX. Page342

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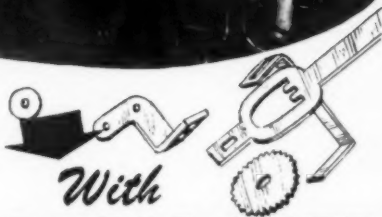
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As the Advertiser SEES IT

FRUGALITY: FIRST LAW OF BUSINESS

The first law of sound business management should be intelligent frugality. A business in which the luxury of spending is viewed as a means to obtaining practical, beneficial results is a healthier operation than that business which carries about with it the dear pleasures of wasteful appropriations and extravagant expenditures regardless of maximum benefits to be derived therefrom. Frugality and intelligent expenditures are to a business what leanness and muscles are to an athlete.

But frugality is not penny pinching. Fiendishly hacking off appropriations in an effort to save money rather than as a means of streamlining production is merely hacking at the muscles of the athlete as well as the fat. No mutilated athlete ever won anything except a hospital bed; penny pinching businesses don't win much more.

When expenditures are to be made the intelligent manager asks: of an expenditure for new equipment, Will it increase production? By how much? of the cost of hiring additional managers, Will the managerial force achieve objectives faster? Will it release men for deployment on special projects? of an advertising appropriation, Will it reduce salesmen's calling time? Will it increase sales?

When these questions are answered affirmatively the expenditure is approved. Frugality expects a just return from each investment: equipment is bought, production methods are streamlined, adver-

tising campaigns reduce sales costs, wages are increased to reduce the expense of labor turnover, and a hard hitting, ambitious organization secures its place in the sun.

But what of the nickel and dime boys? Ah, you know them well: frugality carried to absurdity. No expenditures for new equipment, but a large maintenance crew to keep the old wrecks clanking another day no well-paid managers, only mediocre talent, the intelligent and ambitious find other jobs no advertising campaigns, but a high sales cost no intelligent handling of salesmen's commissions, only expensive low sales volume what, hire a firm of consultants to analyze our business? Listen, young fellow, I've been in this business for a good many years, and I guess I know how to run it. I don't hold with these fancy specialists. We're doing O.K.

The penny pinchers are easily recognized: a high labor turnover, an apathetic sales force, low production, inferior equipment, a mediocre product. Penny pinching is a disease which spreads its poison into every vein and viscera of the body. It corrupts initiative, corrodes teamwork and causes dissension and disunity. It never results in the full development of a company.

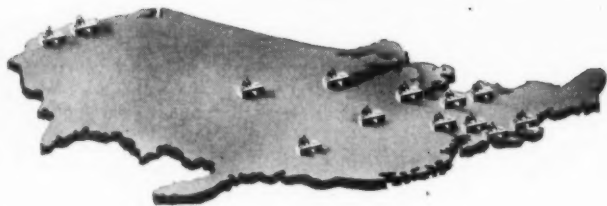
Let us have instead, intelligent frugality. Send forth a dollar so that it may return leading little dollars by the hand. A healthier, better business will result. Hack off the fat, yes, but save the muscle.

William F. Schleicher
Editor

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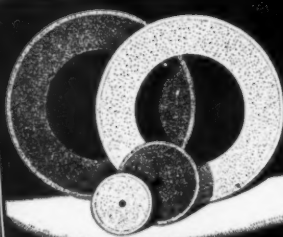
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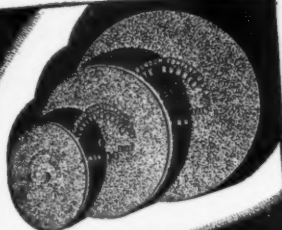


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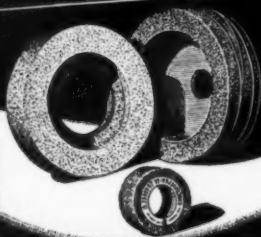
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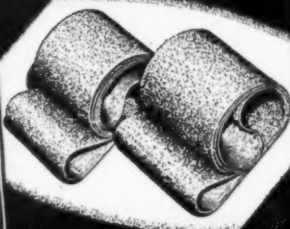
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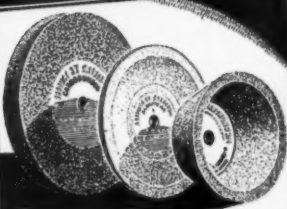
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RYERSON STEEL

STREAMLINED PRODUCTION FLOW, ORIGINAL TOOLING

at Bush Mfg. Co.

By Gerald Eldridge Stedman



Unusual production volume per square foot is being achieved. Manufacture of condensers is efficient, utilizing many special machines designed by Bush engineers. Conveyors are used throughout the plant.

ORGANIZED in 1907, the Bush Manufacturing Company of West Hartford, Connecticut has grown steadily, having survived fundamental production change-overs. Now, one of the larger condenser manufacturers, it is housed in a new 100,000 sq. ft. completely modern plant having excellent layout, flow and latest equipment, much of the latter of its own origination.

Bush made radiators at one time for such automobile concerns as Pope-Hartford, Marion, Lozier, Stutz, Stewart, Selden, Locomobile, Mack Trucks and American LaFrance fire engines, in the old days. Using management foresight, Bush early switched its production to refrigeration and heat transfer equipment as those industries began to expand. It now produces condensers, evaporators, unit coolers, special steam and water coil equipment.

Bush distinguished itself in war production by turning out intercoolers whose function was to lower temperatures of the compressed air which, at high altitudes, is essential to feed into aircraft engine carburetors. It also made panel, plug and heavy duty coolers, air control and ice making coils and spun housings for propellor feathering mechanisms.



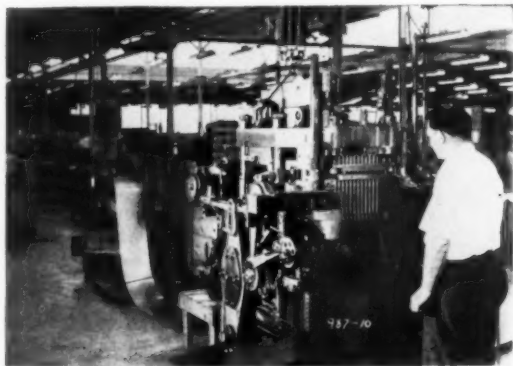
Fig. 1. This hydraulic tube bender replaces a hand bending operation and results in a 20% increase in production. Automatic action assures uniform bend. After bending, the bare tubes are palletized on special trays carrying eight holders.

Bush has alert management capabilities in J. W. Hatch, President; E. M. Flannery, Vice President; F. T. Carney, Works Manager. Their pension-profit plan sets aside 20 per cent of earnings before taxation. Provisions for group insurance, paid holidays and vacations are unusually liberal. Supervisional ratio is one to 25, astonishingly low. At the large Bush tool shop, it is only one to 12. Turnover is less than 1 per cent/month; absenteeism 24 per cent. Plant efficiency is at 132 per cent, scrap loss one-third of one percent, materials handling only 5 per cent of indirect costs, based on actual time studies. Accident

frequency is 18.9, using the Travelers' Insurance Index, 4.5/1,000,000 manhours using customary standards. The plant had only nine lost time accidents in the entire past year. Harry Kromas, Production Superintendent, and Andrew Molloy, Personnel Manager, have played their management part in this record, along with the others . . . and it is a record in which the entire Bush organization may be proud.

In this article, I shall mainly detail flow sequence observed along the condenser line; unusual production volume per square foot being achieved here without backlash and little waste mo-

Fig. 2. This special machine, designed by Bush engineers, assembles fins automatically. This machine supercedes two machines previously required for this operation. A progressive piercing and forming die is used to punch the fins.



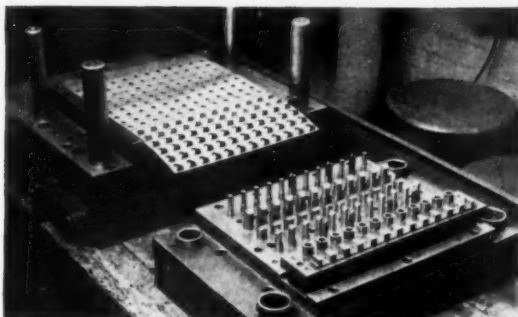


Fig. 3. The progressive die pierces and forms the fins. The first stage pierces hole, second locates points, third accomplishes cross slotting, fourth completes slotting, fifth produces longitudinal slit on center with the hole, sixth is an additional piloting operation.

tion. The result, of course, is very low direct costs.

The new Bush plant has straight down flow with receiving and shipping at opposing ends of the same plant side, and ample sidings on New York, New Haven & Hartford Railroad. Finned condensers are coiled up to 16 tubes; 90 per cent of tubing being copper $\frac{3}{8}$ " O.D. of .035" ga. wall, the remainder Bundy of $\frac{3}{8}$ " O.D. and .028" wall. Most of the tube bending for these coils was formerly done on manually operated benders. Recently, automatic tube bending of Bush design has been installed with production increases of about 20 per cent per operator over hand bending.

These Bush automatic bending machines incorporate ingenious tool and fixture design, figure 1. A 20' table provides channel support for tube and bending mandrel, number of bends per coil varying with specifications and controlled by automatic stop. The tube encloses the bending mandrel and lays on the channel of the table, on one end of which the bending head mechanism is installed. An ordinary oil reservoir aloft is connected by gravity flow to the rear end of the mandrel rod. Oil is fed through the hollow mandrel tube to the working point of the mandrel. The tube is progressively bent

around an upper and lower bending die automatically, mandrel inside the tube acting to prevent collapse. Tube length is 20'. The setup uses solenoid operated stop gages. The tube bender is hydraulically operated with solenoid valves. The operator picks up the tube, turns it over and places it on a locating pin, then presses the control button to start succeeding bending actions. Automatic action assures more uniform bend. After bending, bare tube coils are palletized on special trays carrying eight holders. The work moves to cut-off, I.D. and O.D. burr, then to station before condenser fin assembly machines.

Tube bending and fin assembly operations are parallel during initial phases of this flow sequence. Metal is received in 6" to 12" coiled strips, weighing 1000 to 1200 lbs. The SAE 1010 steel used has .007 ga. Copper up to 12" coiled strips is .006 ga.

Copper comes by overhead monorail in coils to load on automatic stock reel having 2T roll capacity. Reel action is controlled by mercury switch through an actuating lever riding on the material unwind. Material leaves the stock reel and comes to geared roll feeds mounted on the machine. This entire apparatus and its progressive dies are of Bush tool engineering, figure 2. Work then enters multiple progressive

piercing and forming dies. The machine will fin up to 12 tubes in one coil. The bare tube coil is positioned at the rear of the press action to receive the fins as they are fabricated.

In the multiple die progression, figure 3, first stage pierces hole, second stage is a locating pilot, third stage accomplishes cross slitting, fourth completes slotting, fifth produces longitudinal slit on center with the hole, sixth stage is an additional piloting operation, seventh stage forms the eyelet and the eighth stage forms two wings around the head of each hole. After this multiple forming, work leaves the die and proceeds through a second set of grooves by roll feed to provide clearance for the wings. Waste drops to chute and into scrap pan.

After the groove roll feed, work proceeds to an added pilot operation to finish the hole; half round on back and rectangular shape on front. Final action on this final assembly machine feeds the open wings onto the tubes, positioned progressively to receive this assembly. A die cuts off and flattens the open wing flanges around the tube to form perfect fin contact all around the tube diameter. Fins are spaced from six to ten per inch. Speed of this assembly is 100 fins/min. on 12 tube formation. Fin spacing can be varied by changing two gears. Tubes can be varied in number from 6 to 12.

Away from the press, each finned section comes directly to a two sheet pneumatic assembly press operating at 90 p.s.i., run by the same operator as the fin assembly machine, figure 4. A bottom tube sheet is installed in a positioner of this press. The fin tube section, just assembled, is located on this bottom tube sheet, positioned by gauge stops. The top tube sheet is then installed on the section and pressed home.

Coming off this pneumatic press, the work rides on roller conveyor. The only other operation required is to install



Fig. 4. Tube sheets are assembled by means of this pneumatic press. It is readily adjustable for various sizes of coils.

return bend and such cross overs or extensions, receivers or tanks, as special requirements dictate. Installation of return bends and other appurtenances is by hard soldering at benches adjacent to roller conveyor flow.

Condensers proceed by roller conveyor to transverse track that catches flow from eight lines and proceeds to an end conveyor station from which parts are unloaded for coil cleaning. Apex WW is the chemical cleaner used, soak is 5 minutes, tank capacity 14 coils of 12" x 12" x 3" dimension, vat temperature being 200° F. All fumes are exhausted by air slots around the tank, air flow here being 5 MCF/min.

The finned condenser coils then move directly into test tank, set in tandem with the cleaner tank, figure 5. Test is under water at 300 p.s.i. Bush has developed a unique testing air tool which consists of an automatic locking air

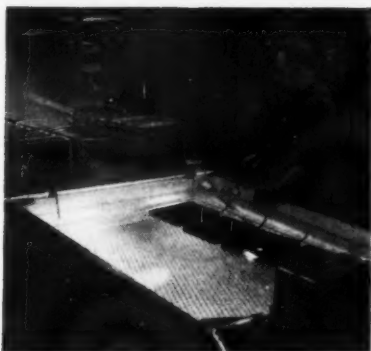


Fig. 5. Port hole lighting, white walled tank and quick clamping of coil to 300 P.S.I. air pressure under water makes the smallest pin hole leak readily visible. After testing, the work is roller conveyed to a lead tin dip operation which is housed in a separate 12' x 30' enclosure.

• • •

clamp nozzle with a second step air valve, all attached to an air hose. The work is under water. The coil outlet is sealed. Pressure of the valve seals the air clamp on the tube, air is introduced through valve center to an automatic 300 p.s.i. measure. This is a unique valve and has many applications; for example, to give measured tire inflation. Bush has applied for patents on it.

Work comes out of cleaning and test to roller conveyor and is moved to lead tin dip operations housed in a separate 12' x 30' enclosure. Its venting system is elaborate, with air slots surrounding each tank. Fumes are exhausted to hood through 15 MCF exhaust blower whose duct at blower has 36" dia.

The first tank, preparator yto lead tin dip, gives condenser coils additional pickle in a Dupont Duclean No. 2 solution. Second tank is cold rinse; work being handled either by monorail hoist

or hand. Third tank provides zinc chloride flux. Fourth tank has a 14T lead-tin metal bath capacity and is heated by 12 — 5000W Calrod immersion heaters. Tube extensions of the coils are stopped off with rubber nipples. Coils are hand dipped in the lead-tin bath to provide protective coating, tangential drain coming out requiring finesse. Some work is too heavy for hand handling. Bush has devised an ingenious hydraulic hoist with a collection of fixtures designed around the peculiarities of lead-tin dip to simulate the efficiency of hand dip methods. This uses a Vickers pump and speed control. It is geared down very slow to prevent freezing action of the deposit and excess coating, figure 6.

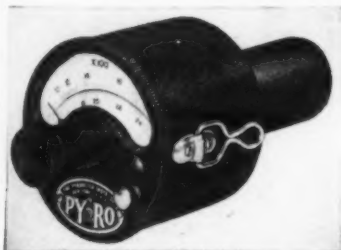
Condenser coils come out of dipping to roller conveyor and to transverse movement which brings them to finish line. The stop-off is removed. Excess of extension tubing is mitred, tube ends

• • •

Fig. 6. Pickle, fluxing and solder dipping. Note lateral ventilating hood design, hydraulic powered transfer hoist, and acid resisting brick floor. Working conditions are excellent and are reflected in increased output.



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are spun to enlarge I.D. and a varied set of other operations are performed to expand or reduce extension, refine inlet and outlet. The coils are given a Stahl-Vis Rotometer test to assure that no restrictions or impedimenta exist in the coil flow. This disc indicator is extremely sensitive. Plastic caps are then installed on tube ends to prevent moisture ingress. The work then moves by roller conveyor to complete lacquer coating, coils being handled by electric hoist. Finally, the condensers move to crating and shipping.

This flow sequence occurs entirely within 60' x 200' area and is in straight line with no backtracking. Line flow is geared to 60 units/hr. of 36 tube (3x12 rows x 16" finned length) condenser coils. The shop is to be commended for its special machine tooling, efficient materials handling, excellent venting system and superb housekeeping. **THE END.**

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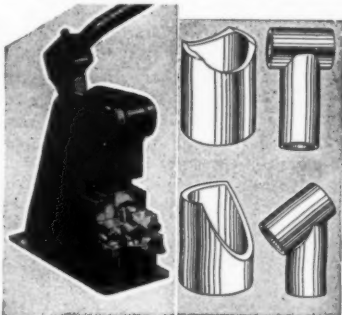
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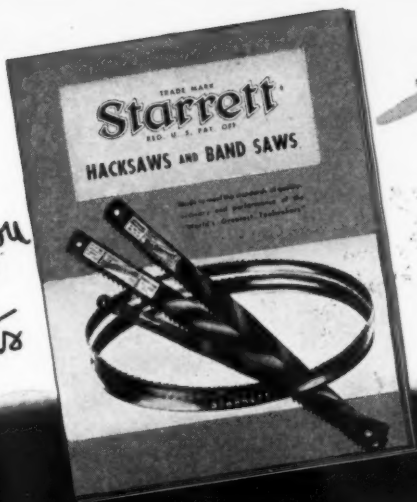
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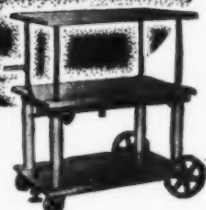
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ELECTRONIC LATHE CONTROLS RESULT IN

Smooth Operation, Sensitivity, Quick Response



by Kermit K. Kuck, Vice President, Monarch Machine Tool Company

Electronic systems to control the flow of power from an alternating current system to a direct current system have been in existence for several years, and have been continually improved. A new electronic application, small enough to fit into the base of a lathe, is discussed by the author.

IT WAS not so very many years ago that the transmission of power to engine lathes was little removed from the original conception of the treadle-type lathe. Even as late as the early 30's a surprising number of the so-called "first-rate" designs still called for a belt drive to the machine from an overhead countershaft.

Because the electrification of lathes has really come about so recently, it seems appropriate to introduce my subject with at least a brief review of the more important developments which preceded the successful application of electronics to the drive problem.

The first step was the logical one of replacing the overhead belt drive with an individual electric motor. This resulted in machines of greater metal-removing capacity, which naturally reduced costs, particularly where the motor was used in conjunction with a geared headstock which, depending on the gear train selected by the operator, was capable of supplying a multiplicity of spindle speeds. This, of course, was followed by the use of additional motors to perform special functions, such as driving pumps for coolant and hydraulic systems, operating rapid traverses, etc.

Gradually as better turning tools came into existence and the variety of alloys was increased and the maximum cutting speeds established, it became apparent that a fixed number of specific spindle speeds did not meet all of the requirements of industry. Consequently, the attention of machine tool engineers was directed along the lines of variable-speed drives.

Many attempts were made to build up drive units having adequate power and wide flexibility in speed range. Some were mechanical, some hydraulic, and some electrical, and there were also those which were a combination of two or more of these.

Our company sought as earnestly as any for a reasonable solution to the requirements of a variable speed drive. At the insistence of customers we even built a considerable number of special machines, although we had to proceed without the knowledge of how to correct certain drive weaknesses which persisted. However, these machines within their limited capacities served definitely to show the way for future developments, and more or less convinced us that the best solution to the problem would be found along electrical lines.

Electronic systems to control the flow of power from an alternating current system to a direct system have been in existence for several years, and have been continually improved insofar as fineness of operation is concerned. Unfortunately, however, these improvements and modifications have in most cases resulted in a more bulky and expensive piece of equipment. Often electronic control equipment is many times larger than the motor it is controlling, and considerably larger than electro-mechanical rotating equipment used to accomplish the same purpose.

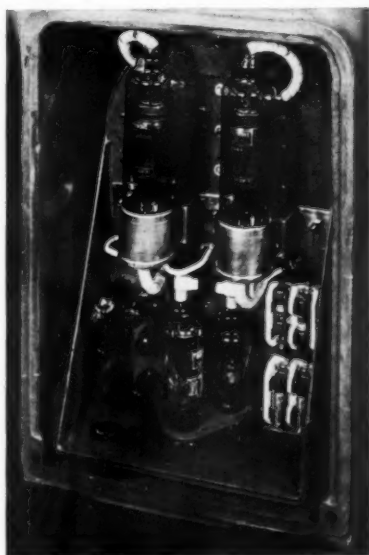
In our case the only unit small enough in size to fit into the space available in the toolmaker's lathe employed

single - phase, full - wave rectification. The maximum ampere rating of the grid-control rectifier tube was 6 amperes, the largest capacity tube available at the time. Utilizing two tubes, the rating of the unit could be brought up to 12 amperes, the full-load rating of the 3 H.P. motor which was to be operated with it. This left no reserve whatever for acceleration or overload without seriously affecting tube life. To overcome this handicap, current limit was included in the control scheme. However, it was found that, if the settings such as to utilize somewhere near the maximum capacity of the tubes, the control of the motor was adversely affected.

The reserve needed to accelerate the

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Fig. 1. 16-ampere xenon-filled tubes for electronic control fit snugly in base of lathe.



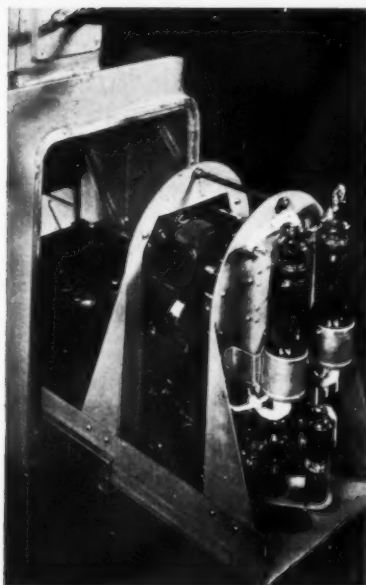


Fig. 2. Ready accessibility for maintenance is a feature of this electronic control.

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spindle, as well as to take care of occasional overloads, simply was not present. The large number of control tubes and their associated circuits which had to be employed resulted in a bulky piece of equipment utilizing every available bit of space in the base of the machine. Moreover, the control was divided into a number of units and mounted separately which, of course, introduced assembly and maintenance difficulties.

As the limitations of the unit just described became more apparent, another unit employing three-phase rectification was investigated. In the opinion of our electrical engineers, it was quite an improvement electrically over

the first unit. However, to fill all the drive requirements, the unit was so large that it had to be housed in a separate control cabinet and placed on the outside of the lathe or apart from it. In fact, the size of the control cabinet almost equalled that of the lathe.

Realizing full well the difficulties which always surround the design and development of anything new, our electrical engineers, nevertheless, decided to try their own luck at developing a tube control for this application. In general, we wanted a unit to supply power to a direct-current motor required to operate over a wide range of speed settings, with the speed at each setting remaining substantially constant over a wide variation of power requirements. Such things as quick acceleration for forward and reverse speeds, fast starting and stopping, and the like, needed to be considered. In addition, size and cost of the device had to be kept to a minimum.

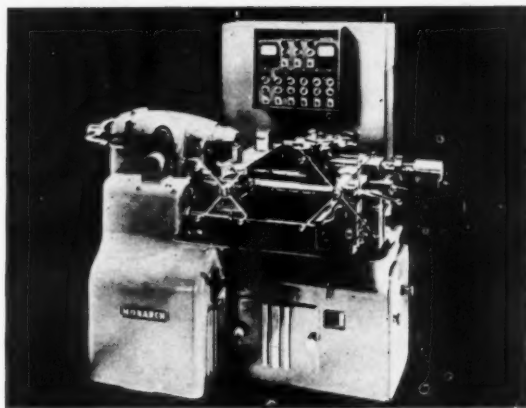
It was apparent that our needs could best be filled by using a single-phase circuit design, providing a grid-controlled rectifier tube with a high enough ampere rating could be acquired. The first attempt was made with mercury-vapor tubes having a maximum rating of 12 amperes. Utilizing two of these tubes adequately met our load requirements, but, when the unit was put under test, it was found the operating temperature limits of the mercury-vapor tubes were too narrow, and that for this reason the unit would not be practical.

About this time a 16-ampere xenon-filled tube became available. It was exactly what we were looking for, (figure 1). Our circuits were immediately modified to employ these tubes and, utilizing commonly available control tubes, resistors, capacitors, etc., a new unit was put under test which, after a few months of further refine-

• • •

Fig. 3. Applying electronic control to a turret lathe provides high speed cycling, fast set-up time and convenience to the operator.

• • •



ment, resulted in the control we have today.

Our desires and requirements in this size unit have been fully realized without sacrificing speed range or regulation. In fact, we believe we can show a substantial improvement over mechanical-electrical rotating equipment.

To make the unit accessible for maintenance, the chassis was mounted on a roller-bearing suspension, (figure 2), so the entire unit could be rolled out from the base of the machine, making it completely accessible to the serviceman.

The quiet smooth operation afforded by tube control, together with its sensitivity and quick response, make it a valuable asset in any machine tool. We are building these units in increasing numbers, and they are being received by our customers with real satisfaction.

At the time that this electronic drive was being developed, it was evident to us that its usefulness was more far reaching than simply to an engine lathe drive, so we simultaneously made preparations to adapt it to a turret lathe

of similar size, known as the Monarch "Speedi-Matic".

Our object in applying the electronic control to this machine, (figure 3) was to provide for a turret lathe a very short setup time by the utilization of electrical controls. In other words, the design was directed specifically to semi-automatic machines such as turret lathes, wherein high speed cycling, fast setup time and convenience to the operator are of real importance.

The electrical panel, (figure 4), includes all electrical controls of the lathe to provide variable and reversible spindle speeds in all positions of the turret and cut-off slides, as well as variable feeds. Rectifiers are provided for supplying energy to the spindle motor and control circuit. The controls required by the operator, figure 5, are mounted on a conveniently-located panel to control the spindle speed. Field and armature potentiometers controlling the main drive motor are interlinked so as to provide continuously-variable speeds in each of the six turret positions and two positions of the

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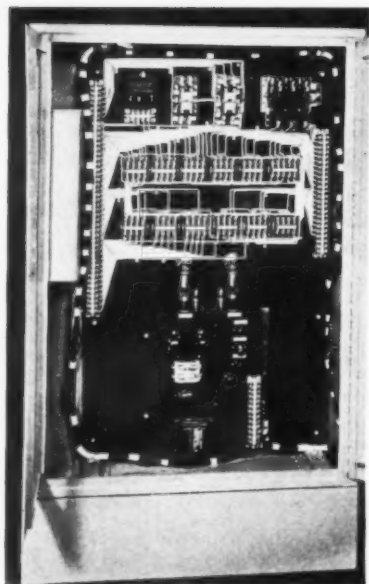


Fig. 4. Electrical panel for turret lathe with electronic controls.

cut-off slide for either forward or reverse direction, the direction of spindle rotation being determined by a switch conveniently located directly beneath the potentiometers.

Separate potentiometers are provided for controlling the speed of the feed motor through a variable range to provide separate continuously-variable rates of feed in each of the six turret positions. A meter is provided to enable the operator to quickly and accurately set up for the desired feed rate. Indicating lights showing the operating controls in each station of the cycle work in conjunction with the controls. Instant reversals, such as are required for tapping operations, are also provided. This type of setup per-

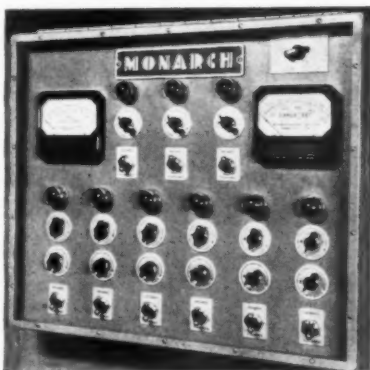
mits optimum operating conditions of the lathe for any particular cut of work operation on the workpiece.

A further electrical feature is a surface speed indicator for indicating at all times the linear speed of the working diameter of the workpiece. This relieves the operator of any calculations in converting diameter to circumference or determining the peripheral speed for a given diameter. In addition to being a great convenience to the operator or setup men, it offers a time saving, since the operator need only know the diameter on which the tool is working and the surface speed at which the cut is to be taken. With the machine running in any given position, he may then manually adjust the spindle speed, and hence the surface cutting speed to the correct value as observed on the surface speed indicator.

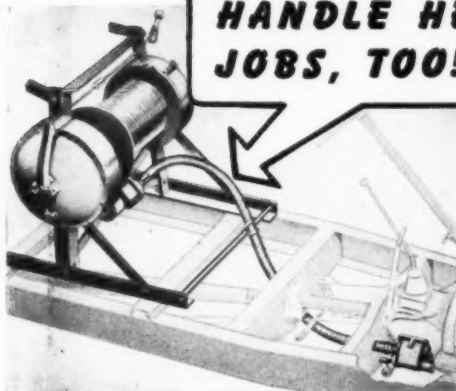
All of these functions are the result of the proper application of electrical controls to a machine which at one time was merely a manually-operated turret lathe.

• • •

Fig. 5. Controls required by operator for electronically controlled turret lathe.



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Fig. 6. 13-inch precision toolmakers lathe.

• • •

I should like to call to your attention one more machine. It is one of our latest designs, a 13" Precision Toolmaker's lathe, figure 6. It has many features which are obtainable solely through electrical means.

Gear transmission mechanisms are a very vital part of most machine tools, and methods for the quick and positive selecting of desired gear trains is a constantly-recurring design problem. Selective gear transmissions have been in use for many years; however, on this machine a control means is provided for electrically selecting a gear train of a transmission.

An electrical switch having as many positions as there are gear trains in the transmission is provided. Manually operated to any of the positions in any sequence with the power-actuated shifting mechanism, it causes a shifting to the corresponding gear train. Thus, with an absolute minimum of

physical effort, the operator is provided with a means of selecting and shifting to whatever gear train is to be engaged at any given time.

Circuits are so arranged in this device that clashing of gears is entirely eliminated. The shift takes place at a pre-determined shifting speed and an electrical interlock assures that the shift is completed before the speed control potentiometer will bring the main drive motor up to the desired operating speed.

The operator's controls are located on the panel at the right-hand side of the apron, figure 7, they include a start, stop and reverse push button for the main motor driving the headstock, and a potentiometer for controlling the spindle speed.

The remaining switch on the control panel permits the operator to make use of an additional time-saving feature, whereby the machine will auto-

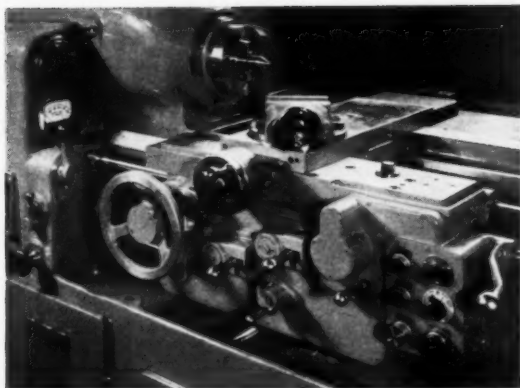


Fig. 7. Operator's controls for 13-inch precision toolmakers lathe.

matically change spindle speeds to conform to a pre-set surface cutting speed.

When making facing cuts upon a workpiece or form turning by means of a single-point cutting tool, the distance of the cutting tool from the center of rotation of the work varies considerably. If the rotation of the lathe spindle is held constant, the surface cutting speed varies as the distance of the tool varies with respect to the center of rotation of the workpiece. The greater the distance between center of rotation and the cutting tool, the greater will be the surface cutting speed.

With the variety of materials being turned on lathes, there have been established different surface cutting speeds for the various materials which are most effective for turning each of these materials. Since these cutting speeds vary widely, it is desirable that surface cutting speeds shall remain constant at all times, regardless of whether the cutting tool is making a longitudinal or traverse cut or some combination thereof which will produce conical work or some type of form.

There have been previous attempts to produce a mechanism which would control the speed of the spindle of the lathe, so that it could be varied inversely to maintain the surface cutting speed substantially constant as the tool moved to and from the center of rotation. Heretofore, however, these designs have not taken into consideration the desirability of obtaining an infinitely-variable range of surface cutting speeds on the lathe. It was, therefore, one of the objects of this new design to provide a control system for a lathe to vary automatically the speed of the spindle to maintain constant surface cutting speed of the workpiece at any predetermined speed setting.

Another requirement was to provide a control system wherein the spindle motor would be capable of being manually varied in speed over a range at least equal to the difference between successive gear ratios of the lathe headstock, and also capable of being automatically varied over a second range of speed in accordance with the variation in the movement of the cross slide, to maintain a substantially-constant linear speed on the cutting tool.

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provisions for selecting one of a plurality of different gearing for driving the spindle at different rates of speed, is driven by means of a direct current drive motor. As the position of the tool changes with movement of the cross slide, the speed of the spindle and workpiece are automatically varied so as to provide a constant linear speed at the point of the tool.

Indicating means are incorporated in the control system to provide a convenient method of determining the surface speed at which the control system is set at any given time.

There are many other features on the lathe that are the result of the application of electrical equipment. In addition to the equipment just described, the machine houses an additional five electric motors, only one of which is tied in with the electronic control. The others are standard motors with conventional controls which drive the pumps for lubricating, coolant and hydraulic systems, and operate the rapid traverse mechanism of the lathe.

THE END

From a paper presented to the Machine Tool Forum at Westinghouse Electric Corporation, Buffalo, New York, April 22 and 23, 1948.

MEAD APPOINTS TWO AGENCIES

Mead Specialties Co., manufacturers of air cylinders and other air operated devices, recently made two new agency appointments to give better service to its customers. The R. M. Wright Co., 7401 Du Bois St., Detroit, will represent the company in the entire state of Michigan except the lower tier of counties. Eastern Pennsylvania, the lower half of New Jersey and the states of Delaware and Maryland will be handled by the Jackson-Walter Co., 210 N. Thirteenth St., Philadelphia. Both agents have technical staffs qualified to assist customers interested in the use of air operated devices.

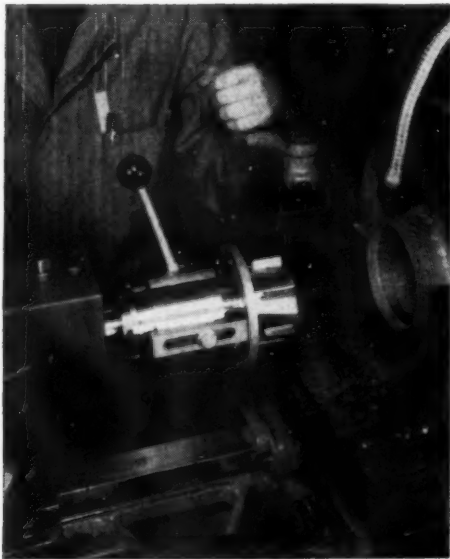
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LINCOLN FOUNDATION ANNOUNCES SCHOLARSHIPS AND AWARDS WINNERS

Awards of \$1,000 to the University of Cincinnati, \$500 to the University of Minnesota and \$250 to Iowa State College were announced today by The James F. Lincoln Arc Welding Foundation. These awards are to be used for providing scholarships in each school.

The awards represent top honors in the Foundation's Annual Engineering Undergraduate Award and Scholarship Program in which awards are given to engineering undergraduates for the preparation of papers on arc welding and its uses. The scholarship funds are awarded to the schools in which the authors of the three best papers were registered and duplicate similar cash awards to each author. Papers were submitted by students from 46 different engineering colleges in all parts of the country.

The paper, "Standardized Welded Building Structures for Railroads", received the first award of \$1,000 for Alan R. Cripe of the Department of Architecture, University of Cincinnati, Cincinnati, Ohio and, in addition, the honor of having the four scholarships, named in his honor, awarded to the University. Mr. Cripe resides at 831 Harvard Blvd., Dayton 6, Ohio.

The paper, "Arc Welded Design as Applied to a Combination Hay Buck-Stacker", written by William David McCoy, undergraduate in the Electrical Engineering Department of the University of Minnesota, Minneapolis, Minnesota, received the second award of \$500 with like amount going to the University for scholarships in his name. Mr. McCoy resides at Pioneer Hall, University of Minnesota; his home being in Duluth.

The third main award went to William W. Robinson of the Mechanical Engineering Department of Iowa State College, Ames, Iowa, as author of the paper, "Vises Fabricated by Arc Welding vs. Cast Visers." A similar amount went to the College for a scholarship named in his honor. Mr. Robinson resides at 115 North 33rd Street, Omaha, Nebraska.

In addition to these, smaller awards totalling \$3,500 were made to 68 undergraduates representing 43 engineering colleges and universities.

The Annual Engineering Undergraduate Award and Scholarship Program of the Foundation was announced October 15 of last year and closed May 15 of this year. Judging of the papers was conducted by Dr. E. E. Dreese, chairman of the Board of Trustees of the Foundation and head of the Department of Electrical Engineering at Ohio State University. Dr. Dreese was assisted by Professor Justus Rising, Department of General Engineering, Purdue University, and Professor Kenneth E. Quier, Department of Mechanical Engineering, Pratt Institute, Brooklyn, New York.

The closing of this program marks the end of the first of a ten-year series of annual competition for engineering students.

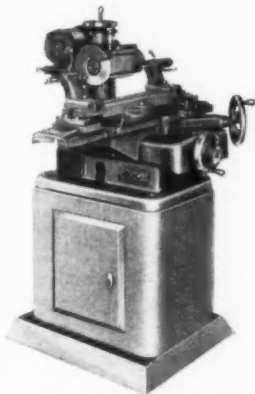
The purpose of this program, as stated in the rules, is to encourage the study of design for arc welding through the preparation of papers by students of engineering in institutions of higher learning upon whose shoulders rests the responsibility for future industrial progress.

The present study indicated that while arc welding is being applied extensively, there remain innumerable applications for still further economic utilization of the arc process.

AMERICAN SOCIETY FOR METALS ANNOUNCES APPOINTMENTS TO HONORARY COMMITTEE

A. G. Bryant, president of the National Machine Tool Builders Association, together with seven presidents of other National Associations in the Alloy Steel consuming and producing fields, and the presidents of the three largest steel producing companies, have accepted appointments from the American Society for Metals to serve with the Society's president, Francis B. Foley, and the Society's vice president, Harold K. Work, on the honorary committee covering the "Salute to Alloy Steel", central theme of the National Metal Congress and Exposition, which holds its 30th annual convention in Philadelphia, October 25th to 29th.

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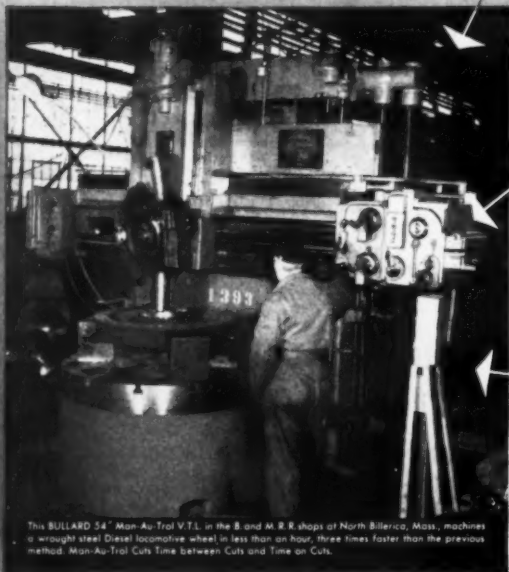
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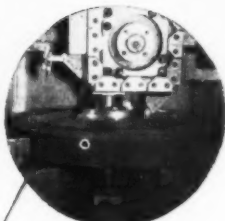
BULLARD MAN-AU-TROL V. T. L. AUTOMATICALLY MACHINES DIESEL WHEELS 3 TIMES FASTER



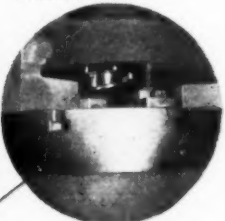
This BULLARD 54" Man-Au-Trol V.T.L. in the B and M R.R. shops at North Billerica, Mass., machines a wrought steel Diesel locomotive wheel in less than an hour, three times faster than the previous method. Man-Au-Trol Cuts Time between Cuts and Time on Cuts.

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BULLARD CREATES NEW METHODS TO MAKE MACHINES DO MORE



Boring tool and turning cutter on B. and M.'s Man-Au-Trol V.T.L. have nearly finished cuts. Head then moves to right to straddle face hub.



View from underside showing boring tool at end of cut, ready to move to right to take straddle cut.



Finish of hub straddle facing operation. Now head and bar move to center of bore and rise to index position.






HARD METAL CARBIDES PROVE THEIR VERSATILITY

by J. S. Gillespie
Carboloy Company, Inc.

To the better-known characteristics of the hard metal carbides—i.e., their high normal and "red" hardnesses, great wear resistance, and exceptional rigidity—should be added still another property—versatility. Actually, the scope in use of these ultra-hard powder metals may come as a surprise to many, since until recently, carbides were generally thought of almost entirely as metals for making cutting tools and wire and tube drawing dies.



WITHIN the past few years the use of hard metals for wear resisting parts, as well as for parts that require great stiffness, high compressive strength, etc., has already become well established in such widely divergent industries as the textile, oil, wire, food and chemical industries, to name just a few.

Nevertheless, the metal working industry continues to show the largest variety of individual applications of carbides for non-cutting tool purposes. Examples can be found in nearly all of the various branches of this industry. The examples cited here, while not complete of course, are typical of the uses to which Carboloy hard metal carbides are currently being put.

CARBIDES IN MACHINE TOOLS

Hard metal carbides have been applied to machine tools in the forms of ways, pins, and numerous other shapes, to lessen the harmful effects of localized wear. Cylindrical bearings of solid carbide have been tried out on an experimental basis with encouraging results.

Currently, many centerless grinder rests are being rendered almost impervious to normal wear by having strips of hard metal attached to them, Figure 1. These strips usually have a rectangular cross section and range upwards to 9" in length, although Carboloy tip

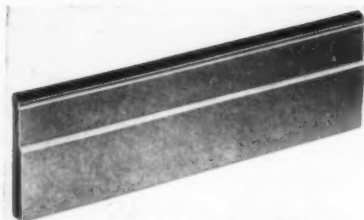


Fig. 1. Many centerless grinder rests are being rendered almost impervious to wear by being tipped with cemented carbide. One such rest averaged 575,000 pieces between re-grinds, as against an average of 1,600 parts per re-grind on high speed grinder rests on the same operation.

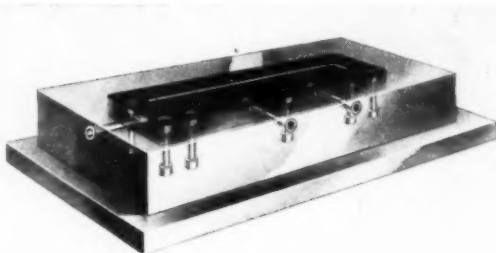
blades as long as 42" have been successfully applied. Carbide-protected grinder rests of course have a much longer service life. In one case, carbide rests averaged 575,000 pieces between re-grinds, as compared with an average of 1,600 parts per re-grind on high speed steel grinder rests on the same operation. This may be considered typical.

Parts in use on automatics now include even carbide-lined collets. Typical of reports received of the performance

of such collets is the experience of one aircraft factory where S.A.E. 6310 bar stock was being used in Swiss-type automatics. The steel collets originally installed on this job showed a useful life of some 5 hours. Steel collets lined with Carboloy bushings are lasting well over 1,000 hours under identical service conditions.

Another interesting and money-saving application of carbides on automatics is its use for protective stops, especially on fine-finish machines where an extremely high degree of accuracy must be maintained over long runs. In one instance, small pieces of carbide are brazed onto the stops. Even where hardened steel pads on such

Fig. 2. Shown here is a phantom view of an actual deep drawing die, assembled from four sections of Carboloy cemented carbide, by means of a new attachment method perfected by Carboloy Company. Some of the attachment points are shown. The carbide portion is over 12 inches long. This new attachment method makes it possible to attach carbide parts with screws, studs, etc., in the same manner and with the same ease as similar parts made of softer metals. It is particularly effective where large carbide sections are to be used, since now large wear parts may be bolted down rigidly and



yet present an unbroken "wear surface". When it is desired to attach carbides by means of studs, screws, etc., approximate location of the point or points of attachment and number of such points are determined. The carbide

part is then provided with machineable "inserts" in these locations. The part may then be drilled or tapped at these points either before shipment from Carboloy Company or by the user "on the job".



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stops may have to be replaced every month or less, carbide-protected stops are reported to maintain their accuracy indefinitely.

Lathes equipped with ways made 100% of hard metal are not yet commercially available. However, some users have—experimentally—attached small sections of carbide at various points along the ways to reduce excessive wear. This was in special cases on high production equipment where carriage movement was confined to a small area of ways. Carboloy Company's recently perfected method for attaching large carbide sections with studs or bolts, figure 2, should stimulate interest in lining lathe ways with hard metal.

Lathe and grinder centers—tipped with carbide metal—have been used for a number of years with marked success. The small sizes are generally made of small cones of solid carbide set into the steel shanks. Bull nose lathe centers, however—of from 3½" to 4" in dia-

meter—are most frequently protected from extreme wear by means of carbide strips brazed to the steel portion of the center. Innumerable production runs have shown that the service life of such carbide-protected centers is measured in terms of months rather than hours of service life.

Among other uses of carbide metals in machine tools are: carbide gaging fingers for automatic gaging; cams; knurling tool pins; guide bushings; and solid carbide boring bars, figure 3.

CARBIDES IN METAL WORKING

Non-cutting tool uses of carbide metal in the metal working industries, however, are far from being confined to their applications in machine tools. For instance, a large manufacturer of steel files reports excellent results from the use of carbide chisels in file making. These chisels cut one tooth per stroke in 1.25% carbon steel (file steel); strike some 360 blows per minute, or 600 blows

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Fig. 3. Boring bars made of solid carbide metal are currently being used to precision-bore holes having a length-to-diameter ratio of between 7 and 8 to 1. The best steel bars are limited to boring holes having a length-to-diameter ratio of 4 to 1 or less.

per 10" file. The high carbon steel chisels originally used on this job would cut 8 dozen "Class A" files, on both sides. After stamping this number, if the chisels were not reground, subsequent files would have to be rated as below "Class A". Carbide chisels now regularly produce 152 dozen "Class A" files (striking 1,094,400 blows) before requiring regrinding of the chisels.

Another manufacturing plant is using a simply-designed solid carbide rivet spinner instead of the former hardened



Fig. 4. This solid cemented carbide rivet spinner is used to spin "button heads" on rivets used in making watch bracelets, where heading cannot be preformed with a hammer. Carbide spinners outlast conventional spinners some 300 to 1.

steel tool with an increase of 300 to 1 in service life. The tool, figure 4, is held in a chuck and rotated at high speed. The un-formed end of the rivet is introduced into the rotating tool, and the cold metal flows into the required "button head," to head-up small rivets used in watch bracelets. Metals usually formed for this purpose are brass, gold and stainless steel.

Another manufacturer is taking advantage of the metal's unusual combination of remarkable abrasion resistance and high compressive strength by using carbide-protected bending bars used for bending .025" thick cold rolled steel channels at right angles in the manufacture of pocket-book tops, etc. These bars are about 24" long and faced all along the entire length with a single section of carbide $\frac{1}{2}$ " thick soldered to the steel "shank", figure 5. In this operation, it is extremely important that

Fig. 5. Bending bars require both abrasion resistance and high compressive strength. This carbide-lined bending bar, used for bending .025" thick cold rolled steel channels in the manufacture of pocket-book tops, outlasts steel bars many times. It also reduces scrap and gives a better finish on the work piece.

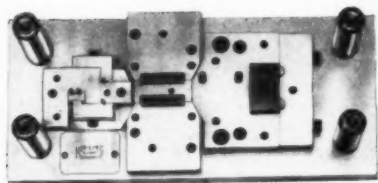


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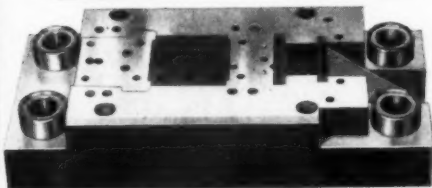
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the bending bar retain a high finish over a long period of time since, if the surface of the bar starts to roughen, the finish on the work pieces will be spoiled. The use of carbide-tipped bending bars has practically eliminated scrap; improved the finish on the product; and has also cut down the cost of replacing the bars.

Another job wherein extreme wear was a problem was in the burnishing of piston pin holes in cast iron pistons. Chrome plated burnishers ran only between 50 and 100 pieces. A solid carbide "bar," however—some 1¼" long by ½" in diameter, figure 6,—burnished more than 5,000 piston pin holes without requiring maintenance, after which the user stopped keeping performance records. It is reported that the lands on this Carboloy burnishing tool also give a higher degree of polish to the inner surface of the hole than did previous burnishing tools.

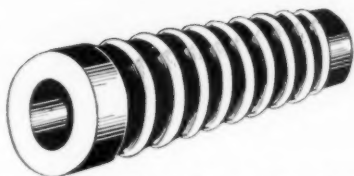
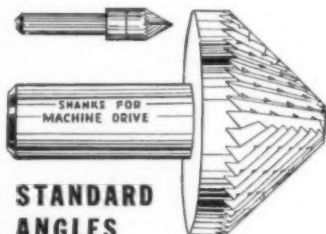


Fig. 6. The high resistance to wear possessed by carbide enabled this burnishing bar to burnish far more than 5,000 piston pin holes in cast iron pistons without requiring maintenance. The chrome plated burnishers formerly used produced between 50 and 100 pieces each.

Another example of how the wear-resisting properties of the hard metals can be utilized to effect savings is in the manufacture of steel and iron tubs. The edges of some of these tubs are beaded with a beading roll which spins a flange on the tub while the tub turns on the beading roll. Checks showed that rolls made of hardened tool steel wore

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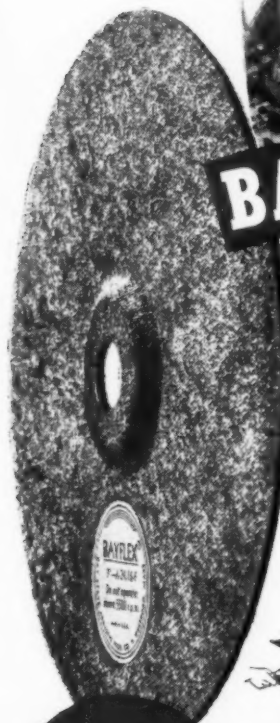
Columbus' discovery proved to be one of the most valuable discoveries in history... and Bayflex Raised Hub Disc Wheels have proved to be a remarkable "find" too, by foundries, welding shops, metal fabricating shops, automobile and truck body repair shops, for removing unwanted metal faster — easier — cleaner. Operators are pleasantly surprised with production possibilities and their increased piece-work earnings.

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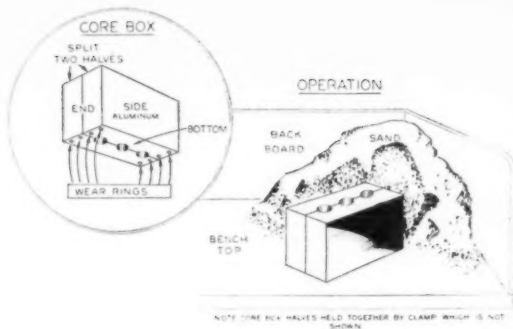
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Fig. 7. Carbide rings, attached to the bottoms of core boxes in a foundry, took the brunt of the abrasive action of sand when the core boxes were rubbed across bench tops to smooth off the bottoms. Wear-proofed boxes produce 9,000 cores before they are repaired; plain boxes produce only 1,500.



away .008" while beading 25,000 tubs made of 26 gage stainless steel sheet and had to be completely re-ground. Solid carbide beading rolls show no detectable signs of wear after beading

25,000 stainless steel tubs **plus** 75,000 iron tubs.

The wear resisting properties of carbides are also being put to use in foundries. One foundry experienced trouble when its aluminum core boxes wore out too rapidly. These boxes were made in halves and held together by clamps. They were filled with core sand and rubbed over a bench top to smooth off the bottom. Since the benches are thus covered continually with abrasive sand, the core boxes averaged only about 1500 cores before they either had to be scrapped or overhauled. Carbide rings (originally intended for use as fish-rod guide rings) were attached to the core box bottoms, figure 7. The rings then took the brunt of the wearing action. These wear-proofed boxes thereafter produced more than 9,000 cores each

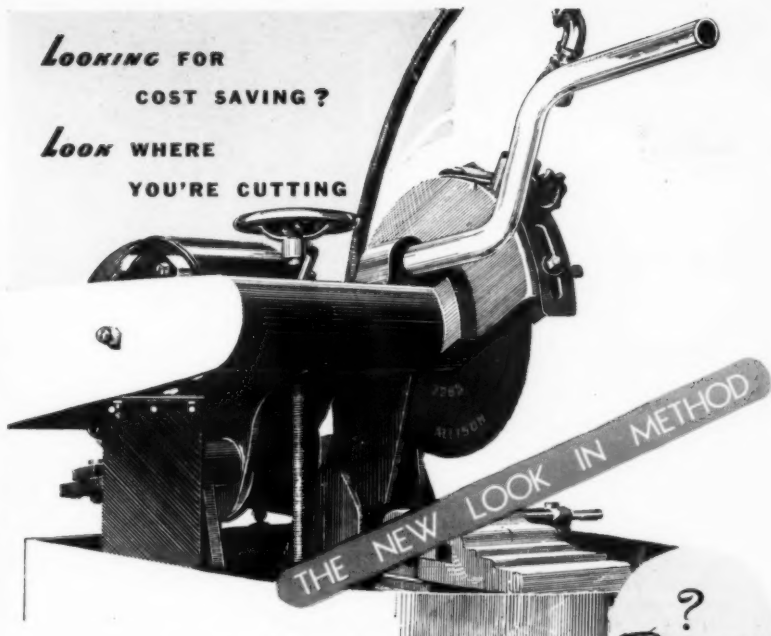
Fig. 8. Shears like these—equipped with working edges of carbide metal—have been in use for several years for cutting soft aluminum sheet. Results are said to be excellent.



Fig. 9. Files with replaceable cutting surfaces of carbide give far longer service than steel files and also cut faster.



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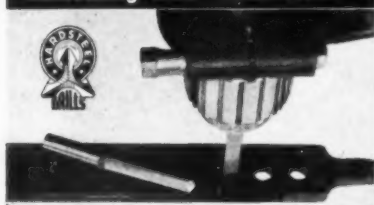
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Fig. 10. These wire nippers are tipped with four separate carbide inserts, set so that they clear each other by .0015" when the jaws are closed. Used for cutting tempered music wire ranging between .004" and 1/16" in diameter, these nippers made 2,000,000 cuts without requiring sharpening, after which records were no longer kept. Steel nippers averaged 27,000 cuts per sharpening.

• • •

before maintenance became necessary.

Another foundry—where large numbers of aluminum ingots and castings are produced—experienced difficulty with the valves employed to regulate the flow of molten aluminum for the ladle. Molten aluminum is so erosive and corrosive that it soon renders such valves useless when made from either the conventional metallic alloys or special refractory materials. Carbide valves were tried and at the latest report, the hard metal valves had already lasted 150 times longer than the best previous valves.

In other branches of the metal working industry, carbides are finding uses in ring, plug and other types of gages; rolls for rolling extremely thin steel sheet; tin slitter rolls; trimmer rolls; spinning rolls; burnishing wheels; man-

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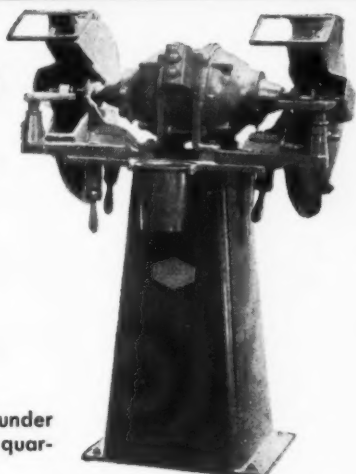
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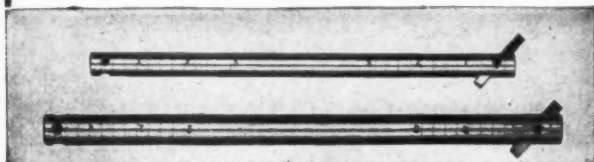
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IT PAYS TO GET THE BEST



Fig. 11. The carbide nib in this sheet metal deep draw die weighs more than 100 pounds and has a 13½" I.D. It is used for drawing large steel cylinders for storing commercial gases under pressure. Carbide sheet metal dies not only have increased service life, but also speed up production and require less maintenance than do similar steel dies.

• • •

drels of all types; Brinell balls or knife edges for more accurate determination of hardness of hard steels; burring tools; and quench blocks.

CARBIDES IN HAND TOOLS

In many cases, too, carbide is being applied to a varied line of hand tools in the form of tips, points, edges, etc. For instance, wire snips and shears having carbide working edges have been in use for a number of years for cutting soft aluminum sheets with excellent results, figure 8. When properly handled, such wear-proofed tools retain their original degree of sharpness indefinitely without re-sharpening. The Disston organization is also producing a lathe file having replaceable cutting sections of carbide, figure 9. Long life and fast cutting are said to be the outstanding features of this file.

One Eastern company equipped its

holding form — holding costs . . .

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Have you ever said, "If I can get cutting tools that I can depend on for consistent results and a minimum of hold-ups for reconditioning, I can take care of more production and hold costs in line"?

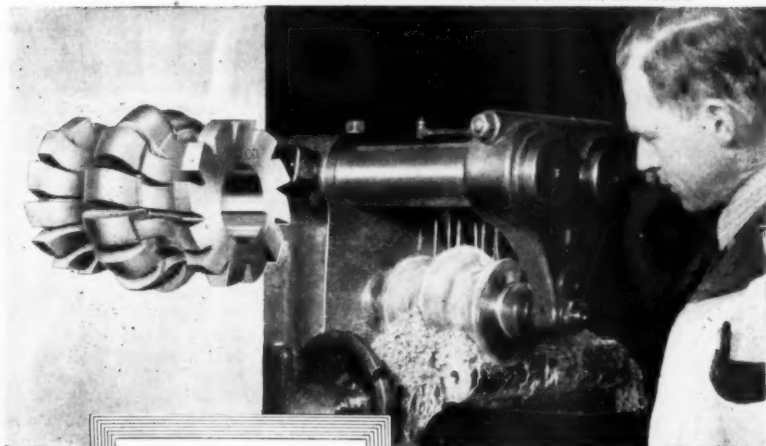
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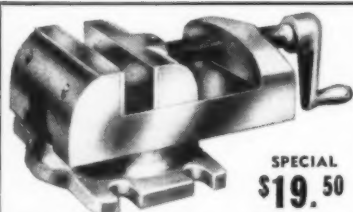
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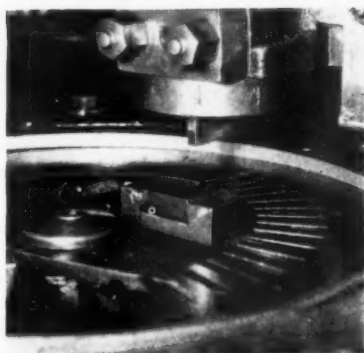


Fig. 12. Use of carbide punch and die sets is steadily increasing. One of the reasons is that averages of from 1,500,000 to 2,000,000 punches are being obtained on such sets between re-grinds, as compared to an average of about 50,000 operations for steel punches and dies of similar design. This carbide punch and die set is being used to punch laminations out of abrasive silicon steel sheet in the manufacture of stators for electric motors.

• • •

wire nippers with carbide inserts to prolong their service life. These particular nippers are employed for the rapid cutting of various sizes and springs made of tempered music wire that range in diameter from 0.004" to 1/16". The wire cutters were tipped with four separate carbide inserts—set so as to clear each other by some 0.0015" when the jaws are closed, figure 10. So protected, they made some 2,000,000 cuts without requiring servicing, after which records were no longer kept. Before tipping they required sharpening after making some 27,000 cuts—i.e., about every other day.

Other hand tools to which hard carbide metals have been applied with excellent results include hand scrapers and "masonry" drills which have proved extremely effective for drilling holes in



Fig. 13. A few of the many shapes and sizes of carbide pieces being turned out on a production basis every day at Carboloy Company. There appears to be no limit to the size and shape in which carbide pieces can be furnished.

sheet metal, aside from their very extensive use for drilling plaster, brick, concrete, tile, etc.

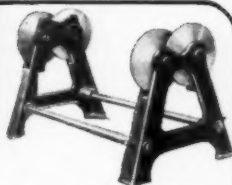
CARBIDES IN PUNCHES AND DIES

The use of the hard metal carbides as die materials for drawing round wire is probably well known since this actually was the first commercial use of carbides. Such carbide dies are today

standard equipment throughout the entire wire drawing industry. In addition, carbide hard metal dies have also been used extensively for some time for bar, rod, and tube drawing.

Of even greater import, perhaps, is the rapidly growing use of carbide dies for blanking, piercing, forming and deep drawing of sheet metal. Parts made of

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43 in.	29 in.	2,000 lbs.
6 ft.	5 ft.	5,000 lbs.
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43 in.	30 in.	800 lbs.



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plain carbon steels, alloy steels, stainless steels, brasses, bronzes, aluminum, and tin are all being drawn already on a production basis with carbide dies. Such dies usually outlast from 20 to 100 similar dies made of hardened tool steel—besides increasing production; drastically cutting down on the time needed to polish and service worn dies; giving a superior finish to the work piece; and generally reducing operating costs.

Modern carbide draw dies range up to 13½" inside diameter, figure 11. Sheet steel as thick as 3/32" is being regularly blanked in carbide dies. Typical products for which carbide dies are currently being used include such widely diversified items as lipstick cases; coffee pots; pressure cookers; pots and pans; automotive and radio parts; steel cylinders for storing commercial gases at high pressures; etc.

Application of carbide punches and dies to blanking is rapidly expanding, demonstrating again that the impact resistance of the hard metals is considerably higher than is generally believed, when the correct grade of carbide is used. Special grades for such work were developed some time ago by the Carboloy Company. Excellent performance has been obtained in the blanking of both steels and other metals.

On typical punching and blanking jobs, averages of from 1,500,000 to 2,000,000 punchings are being obtained with Carboloy punches and dies between regrinds, as contrasted with a comparable average of some 50,000 operations for steel punches and dies of similar design. A typical job on which carbide punches and dies have become "standard" is in the punching of laminations for stators for electric motors out of abrasive silicon steel sheet, fig. 12.

Cold forging with carbide dies also appears promising at this time.

RANGES OF SIZES AND SHAPES

Although the majority of carbide applications still utilize smaller pieces as "tips" and "inserts," the trend is apparently towards the use of larger parts made of solid hard metal.

Actually, there appears to be no theoretical limit as to the size and shape of carbide pieces which may be produced, figure 13. However, 100 to 120 pounds is about the practical weight limit per individual piece, using present manufacturing equipment. Pieces of hard metal with a 100 square inch top surface area are being formed, although such parts are limited to rounds with an 18" diameter and to other shapes whose longest dimension does not exceed 18". Maximum height of such large sections is 8". THE END

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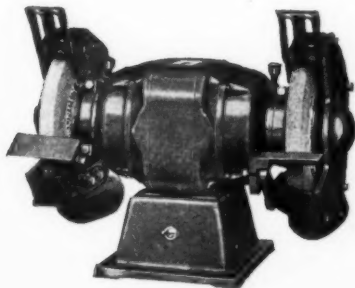


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Letter from England



Written for the MACHINE and TOOL BLUE BOOK by Robert Hutcheson, Editor of MACHINE SHOP MAGAZINE, London, England.



The biggest thing that has happened this week in the engineering world is the opening of the Machine Tool and Engineering Exhibition here in London. Occupying the whole of Olympia, it has to be seen to be believed. Many high executives from some of the best known American machine tool firms are over here and are full of praise, not only for the exhibits, but also for the layout of the show and the organization that has gone into it. This letter is being written on the stand of MACHINE SHOP MAGAZINE at the Show and we have just heard of one leading American engineer who has cabled a colleague to get the first 'plane over here.

Machine tools by leading British, American, Swiss and other Continental countries can be seen here side by side, the majority of them in operation, and it gives us a feeling of pride when engineers from all parts of the world give the opinion that in their various classes the British machines on show are as good as, and very often better than, the equivalent machines from other parts of the globe.

When the Exhibition opened, the Rt. Hon. G. R. Strauss, P.C., M.P., Minister of Supply, who performed the opening ceremony, spoke at the Inaugural Luncheon. In the course of his speech he outlined the Government policy with regard to the export of machine tools. He said that the industry had to re-equip other British industries. From a long term point of view,

nothing could be more important, but because of the high value of machine tools and their ready market throughout the world, a substantial portion of these machines had to be exported.

It was not easy to decide how much should be exported and how much should be retained at home. We had to export some machine tools because we could not do without the food and new materials they brought us in return. It would be useless to re-equip our home industries with the most modern machine tools available if our workers, through lack of food or materials, were unable to operate. The wise thing to do was to keep the problem under constant review. On the one hand the needs of each industry requiring machine tools must be considered and on the other hand changing export prospects must be borne in mind; then the balance must be struck which best meets the conflicting demands for makers' products. And that is the policy which the Government is pursuing.

Mr. Strauss voiced the opinion that if we are to prosper, other countries must prosper also. Deliberately to prevent other countries achieving industrial prosperity by refusing to sell them machine tools would not only be ineffective because others would eventually provide them, but it would also be contrary to our basic policy of maximising the flow of world trade between all countries.

Mr. Strauss continued to say that looking at the problem from a narrower angle

it is obvious that a single machine sent abroad, besides accomplishing the immediate objective of bringing in an equivalent value of sorely needed food, will, if it gives satisfaction, result in repeat orders and possibly further orders by foreign buyers for other British machines, and so lay the foundation of a steady expansion of British trade.

In the world famous yards of John Brown & Co. at Clydebank, the 34,000 ton "Caronia" is nearing completion. This is a steam turbine driven vessel which is due to enter the Cunard White Star company's service before the end of the year. It is believed that this vessel is the largest passenger boat to be built in the world since the war. It was launched and named by Princess Elizabeth nearly twelve months ago and is intended for use on the Atlantic run during the tourist season, and during the rest of the year will be cruising.

Another development that is taking place in John Brown's Clydebank yards is the development of a gas turbine unit intended for ship propulsion. It is believed that

these experiments are showing signs of great promise and we have heard the suggestion made that perhaps the next Atlantic liner built in the yard will be powered by gas turbines.

The Government is launching an intensive new campaign for greater output by making direct appeals to workers. Sir Stafford Cripps, Chancellor of the Exchequer, gave a pep talk to the linen workers in Belfast, and other speeches of a similar nature are being made by cabinet ministers throughout the country to workers in various branches of industry. Running parallel with these speeches will be poster campaigns, and the idea will be to get the message home to the worker in more particular terms than has been the case with the more general posters that have been on our hoardings since the war.

Viscount Hyndley, chairman of the National Coal Board, who is the top man of our newly industrial coalmining industry, has made a pronouncement which, if it can be carried into effect, will bring relief to all industrial and domestic users of fuel. He

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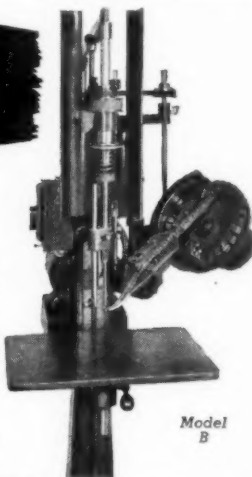
3 Models to drive screws from No. 2 to $\frac{5}{8}$. Model B pictured drives screws from No. 6 to $\frac{1}{4}$. No marring of screw heads or stripping threads. All screws driven to uniform tension.

SEND SAMPLE ASSEMBLIES FOR PRODUCTION ESTIMATE.

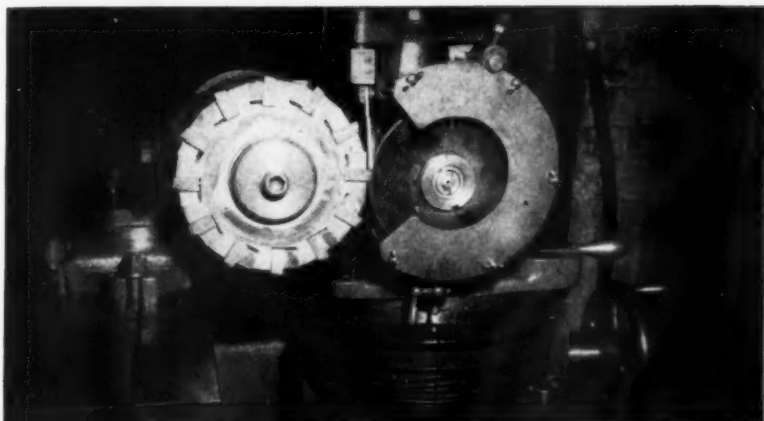
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159

said that coal prices can be increased indefinitely; to keep their fuel costs down users will be forced to consume less and this applies particularly to the export market where competition is increasing. Lord Hyndley made it clear that financial losses in the industry must be recovered from within the industry and they cannot continue to be passed on to either the purchaser or the tax payer.

Exports of coal to the Continent of Europe dropped during July and miners' holidays accounted for over 30,000 metric tons of this drop.

The death of Sir Clifford Paterson at the age of sixty-eight years has caused a serious loss to British engineering. Sir Clifford joined the General Electric Company Ltd, thirty years ago when he took charge of, and built up, the company's research laboratories. Starting with a staff of twenty nine under his direction the laboratories grew to one of the largest of their kind and today there is a staff of 1,750. Research is undertaken in all manner of problems that beset an organisation like

the G.E.C. with its vast manufacturing programme ranging from the heaviest of plant to some of the most delicate instruments. Since 1941 Sir Clifford has been a director of the company.

During the past few weeks the country has had a series of small strikes and threatened strikes in several branches of its industry. One of these was in the works of the Austin motor company when several thousands of men came out on strike as a result of differences of opinion about the manning of a new machine. Building workers engaged at the £2,000,000 Petro-carbon chemical factory at Carrington in Cheshire, have struck because the convenor of the shop stewards was dismissed. A threatened strike of lorry drivers is in the air because one of them was dismissed for filling his cigarette lighter with petrol from one of the vehicles; this strike would cause a serious hold up of food distribution in London. Team drivers in the south-east of London are threatening to go on strike because they are of the opinion that a local policeman is exceeding his duty in enforcing certain traffic regulations. And so it goes on!

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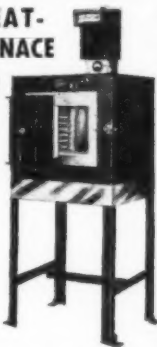
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Lecture No. 2

SALES PROCEDURE—BASIC CONSIDERATIONS

by

E. J. Seifreat

President, The Seifreat-Elstad Machinery Co.

WHO INFLUENCES MACHINE TOOL PURCHASES?

Good manners pay dividends when calling at a plant. Working through the purchasing department requires tact; it is unwise policy to slight it. As important as talking to the men who influence the placing of an order is the discovery of the man who makes the final decision. Should a "canned sales talk" be used? What does the successful salesman "know".

The MACHINE and TOOL BLUE BOOK is happy to present to its readers the complete lectures delivered at the Sales Refresher Course at Cornell University, July, 1948. The course was sponsored jointly by the National Machine Tool Builders' Association and the American Machine Tool Distributors' Association. While lectures deal primarily with the selling of machine tools the fundamental sales principles can be adopted profitably by the manufacturers of general industrial products. The editors thank the NMTBA, the AMTDA and Cornell University for their cooperation in making this material available to their readers.

WHO INFLUENCES machine tool purchases?

Our sales calls are nearly all to places with an impersonal name such as an incorporated company, rarely to an individual person. After we cross the threshold of the impersonal customer we are then confronted with the personnel of the customer's organization. Our problem is to determine who influences purchases of our product.

A quick answer can often be given by naming the man who tells us the order is ours, but this man is often only the apex of the pyramid. Behind this man and his ability are many people who may influence the placing of an order. In a plant of any size there is a group of people whose influence may be negative in that they may be a stumbling block to our access to that group of people who can give a positive decision on our objective—the order.

In many plants, particularly during the war, the first employee of the customer to face us is the guard. Today we are seldom required to pass thru the guard system but go directly to the receptionist. Neither the guard nor the receptionist can give us an order except to get out, but these people control our access to the persons who control the placing of an order. In each case the guard or the receptionist has been assigned certain duties regarding visitors, the duties may be trivial or annoying to us but these duties are part of the rules of this plant. When we enter a plant we are a guest of that plant and our path will be smoother and more pleasant if we act as a guest and mind our manners.

A polite good morning suggests a polite good morning from the person who greets us. A clear statement of our name and our company's name and either the name of the person we wish to speak to or the nature of our business will help the person receiving us start us on our way. We need not be ashamed to mention our name, the name of our company, the name of the person we wish to see, or the nature of our business. Each one of us has seen one or more salesmen in an altercation with a receptionist or guard because the salesman would not impart this information and then became angry because the receptionist wanted the information. After all that is the receptionist's job. We all speak distinctly without a cigarette, pipe, cigar, or chewing gum in our mouth and without liquor on our

breath. We are in search of a machine tool order and not out courting; even so, the lady receptionist respects us when we remove our hat when speaking to her. Patience in waiting arouses the sympathy of the receptionist and usually rewards us with greater diligence in the effort to arrange our interview. While waiting it would be well to remember to use the ash trays and return periodicals to the place where they were found. The lobby of a plant is the home of the receptionist for eight hours a day and she usually appreciates a well mannered visitor.

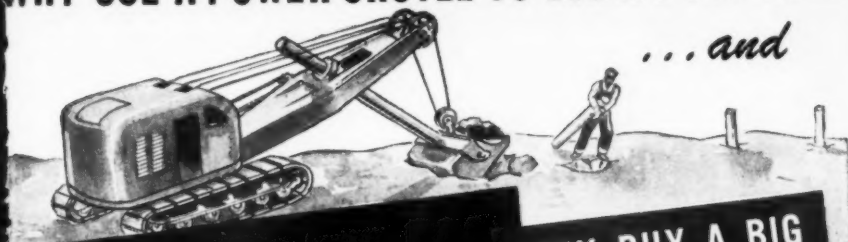
Perhaps we are an "old hand" with special privileges in a plant and the receptionist is new. When this new person learns from within the organization of our standing we will be well remembered. When we proclaim our standing and demand the special privileges, regardless of the person's newness and instructions, we will be remembered—but not kindly.

We have taken some time, so far, to cover simple things that we should all know well and there is the question, "What has this to do with getting the order?" The personnel already mentioned along with secretaries and clerks of people with whom we actually transact business can place rocks in our path to the order, or even make us miss the order. If these people take a dislike to us they can delay in calling the man we wish to see. They can tell us he is not in, and when he is in they can forget to tell him we're waiting for him, or forget to give him our message, all of which will keep us from the customer—perhaps the order—and wastes time—one of our most valuable tools.

One of the old-time salesmen of machine tools and supplies always made a point of "Be kind to the office boy, he may be president some day."

In many cases we must work thru the purchasing department. The purchasing agent can usually make only one salesman happy when he places the order; the rest of us are not too well pleased. Some of us do all we can to evade talking to the purchasing agent, and perhaps we wrong ourselves in doing this. There are many traveling men stories and there are many purchasing agent stories. The purchasing agent is often considered an ogre and the most complete description of this ogre is the old definition, "The purchasing agent has heart of stone, ice water in his veins, he is without bowels, and when

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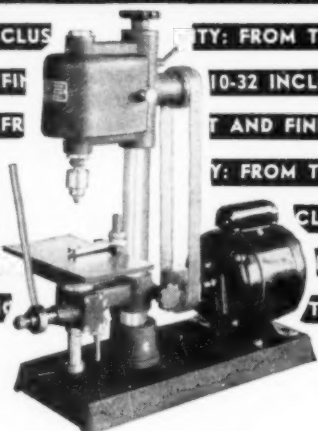
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he dies he will go to hell." The story is old and I heard it a long time ago. I may have omitted a few of the attributes, so please forgive the omissions!

Now that we have covered the unpleasant side of this gentleman, because they usually are gentlemen, if we do not slight them, let us remember we have the job of getting the order and the purchasing agent has the job of placing the order. We must be able to get together if he places the order with us.

There are all varieties of purchasing agents, some few actually make the de-

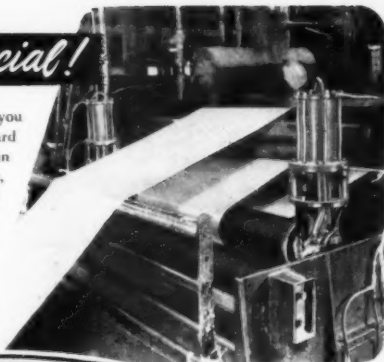
cision of where even machine tool orders are to be placed and out of this group there are some who are well qualified to make this decision. Some purchasing agents have discretionary powers to decide between alternates. In these two cases we have a gentleman with whom we must transact our business.

The other extreme of purchasing agents is often encountered in large organizations where on some items, such as machine tools, the purchasing department converts a requisition verbatim into a purchase order and merely signs his name. Apparently, this purchasing agent has no influence on the placing of machine tool orders. When we know the actual facts this type may not exert a positive influence but he usually can exert a negative influence in that he can exert pressure to prevent the placing of an order with a certain company. Perhaps his objection may be personal because the salesman from that particular company has ignored or even slighted him. We as salesmen, do not enjoy the slights of the purchasing agent and in spite of the odd story about him, he is human and reacts to slights the same as we do. Perhaps the purchasing agent does not know a drill press from a planer, but he is sufficiently human so that he resents having this rubbed into him by our ignoring him or,

(Please turn to next page.)

NO JOB TOO *Special!*

NO matter how special your requirements may be, you can meet virtually any need right out of the standard line of Hannifin cylinders. This is because the Hannifin line is COMPLETE! Any length stroke you want, double or single acting. Cushions for head end, rod end, or both. Ten standard bore diameters to choose from, ranging from 1" to 12". Larger or special types on order. All built to Hannifin's standards for quality: cylinders TRU-BORED and honed... rods ground and polished... all parts precision-made for complete interchangeability. Ask for engineering recommendations. Catalog on request.



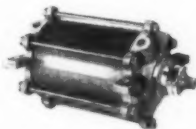
Hannifin flange mounted cylinders applying pressure on roll. Hammer's Mfg. Co. Gear-bild No. 1

HANNIFIN

PNEUMATIC

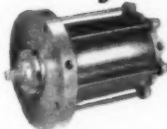
H
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TruBored

CYLINDERS



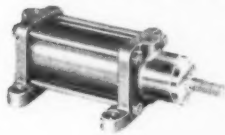
SERIES R

Series "R" Leakproof Cylinders feature the exclusive external packing adjustment design developed by Hannifin for positive assurance against air leakage and increased convenience in maintenance. Sizes 3" to 12" bore. Any length stroke. 6 basic mounting styles, plus a wide variety of combination styles and double end piston rod models.



SERIES LW

Hannifin Series "LW" Pneumatic Cylinders, featuring cup type piston packing, are preferred by many experienced engineers. Six standard sizes from 3" to 12". Any length stroke specified. Built in standard clevis, foot, base, trunnion, flange, and center line mounting styles. Also offered in a variety of combination and double end piston rod models.



SMALL BORE

Developed to meet the need for high quality 1", 1½", 2", and 2½" bore cylinders. Built with "LW" cup type piston construction. Six standard mounting styles. Any stroke desired. Also offered in combination and double end piston rod styles. In all Hannifin cylinders, standardized construction makes for lower engineering costs and quicker delivery.

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10. For use on any material

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SHEARCUT TOOL COMPANY

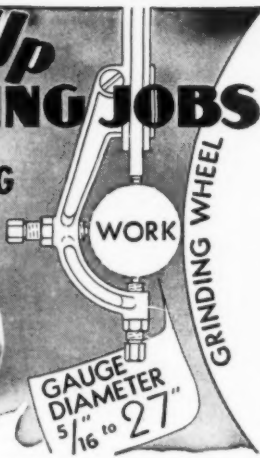
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Pratt Grinding Gauges caliper external cylindrical jobs while work is in motion or at rest. Adapted to straight or tapered work. Tolerances of .0001" plus or minus easily maintained. Visible check on out of roundness, rough grinding and chatter. Cannot grind work undersize unknowingly. Easily installed on any grinder. Pratt Grinding Gauges increase production, eliminate scrap and assure accuracy. A modern precision tool, ruggedly built.

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make a sale. Basically, we all know what has already been said, but do we do it? Many a salesman has failed on one more of these points and has spent much time cussing the customer and his organization, perhaps falsely accusing the customer of things which are not good or honorable business.

There is one other point which often causes a salesman to receive a cold shoulder and, that is entrance through the back door. We may secure a momentary advantage through this back-door entrance, but when our entrance in this manner is discovered it usually results in a cold shoulder of considerable duration on the part of the officials who are in authority, if, indeed, it does not close the front door to us.

We are now ready to consider the people who usually have the final decision on a machine tool purchase. The decision

may be in the hands of the owner or the general manager in the case of the small plant such as the average size tool shop, or it may be the master mechanic in the large plants employing a considerable number of people. When the title of master mechanic is used, it is used because this is the most commonly used title for the job which has jurisdiction over the machinery, tools, and processing of a plant. There are many other titles to the function of

if we do condescend to talk to him, if we talk down to him. Most human beings still wish to learn even though they are no longer in school and they appreciate the person who helps them to this knowledge. A few minutes spent telling him the highlights of the machine we wish to sell, what it will do and what it will mean to his company, may pay a dividend; he will think well of us and we will have him on our side of the fence.

All this may seem merely a preliminary to the main task of positive action to

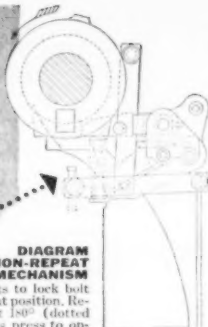
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A SAFER, BETTER

non-repeat clutch

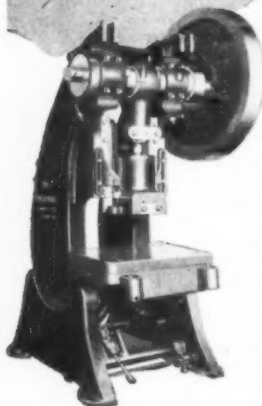
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of NON-REPEAT
MECHANISM**

Arrow points to lock bolt in non-repeat position. Reversing bolt 180° (dotted line) permits press to operate continuously.



A Federal Press will not repeat accidentally no matter how slowly or quickly the clutch is operated. To engage the non-repeat mechanism, operator remains in working position, merely flicks lock bolt. Federals are known for increasing production, eliminating accidents, cutting costs. They may help solve your production problem. Write today for new catalog.

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*Open back
Inclinable*

PRESSES

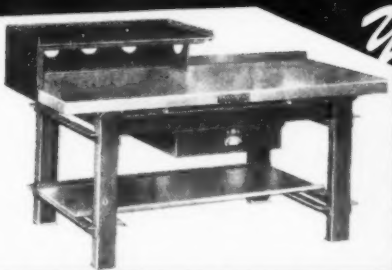
master mechanic, and in most of the larger plants the function may be widely divided without any apparent correlation. In the large plant there is a staff of people who have a hand in the selection of the machine tools and in most cases the manufacturing staffs are consulted before a decision is made. Even in the small plants there are usually one or more persons who will advise the manager or owner before the decision is made. We, as salesman, can usually determine who makes the final decision when a machine

take by trying to go directly to the point of greatest influence if this influence is beyond the function of the master mechanic and openly by-passing this man. We are not always asked to speak to persons who we know have major influence, much as we would like to speak to them. If these people know us well enough and respect us they may ask to speak directly to us, and when this does not occur we have a problem of handling the interview so that these persons will

(Please turn to next page.)

tool is purchased, because we are usually in contact with this person. After this contact we are faced with what is often the \$64.00 question; who else is involved in making the decision? This is a problem which calls for ingenuity and we must be diplomatic as well as ingenious. Here we have to study the personnel of the customer company which starts with the delegated power of the master mechanic, the power which this man exerts and the power which he delegates to others on his staff and the extent of this power, and the influences of the other people in the organization who are called into consultation. When we are in a position to determine this with reasonable accuracy then we are in a position to do a selling job. From this point on we must work carefully and be sure that our efforts are diplomatic. We can make a basic mis-

PRECISION BUILT!



Yes, **CHALLENGE**
WORK BENCHES
are Precision Built.
They are not of the
Hammer-and-Saw Variety

Accurate work requires an *always smooth, level, unyielding* Work Bench. A Challenge Bench gives you all this.

● The rugged, two inch, cast iron top is carefully machined on top and on *all four edges* at right angles. You can depend on their accuracy.

● The top is supported on sturdy steel channel legs welded into a rigid framework by cross angles. The long channel supports are provided with lock leveling screws by which the top can be kept perfectly level at all times. The lower braces are high enough above floor to permit moving by standard lift truck.

● Tool box shelf at one corner gives added capacity as do the steel drawer and full length shelf below top. Drawer has pilfer-proof lock.

● Built in four standard sizes 28 inches wide and 48, 60, 72, and 84 inches long in three styles (1) complete as illustrated, (2) with tool box shelf and without drawer, or (3) without tool box shelf or drawer.

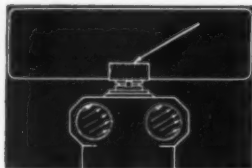
WRITE for Complete Catalog of Challenge Precision Equipment. Including Layout Surface Plates, Bench Plates, Lapping Plates, Straight Edges, Parallels, V-Blocks, Right Angle Irons and Angle Plates.

566



THE CHALLENGE MACHINERY CO.

GRAND HAVEN, MICHIGAN, U.S.A.

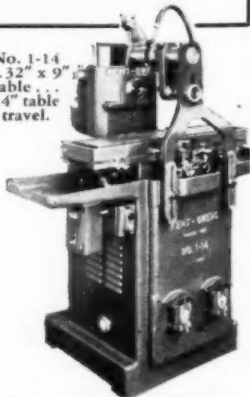


TWIN POST MOUNTING

means Accuracy
IN TOP-SPEED MILLING!

Kent-Owens Machines do your milling *right*—with speed and accuracy that means greater production, fewer rejects, lower costs! The head is mounted on two cylindrical ground steel posts which carry spindle midway between them—an exclusive Kent-Owens feature! No overhang—no cocking action. It's extra rigid... practical... dependable. Write for bulletins on wide range of hydraulic and hand-operated machines. Kent-Owens Machine Co., Toledo, Ohio.

No. 1-14
...32" x 9"
table...
14" table
travel.



KENT-OWENS

Milling Machines

be called into the discussion. We are treading in deep water when we make a direct request for these people or by-pass the person whose function it is to handle our proposal. This whole question is only solved when we understand the customer's procedure and the personnel involved, and then use our ability to cope with the situation.

It is well for us to bear in mind that the business transaction of securing an order is an impersonal relation culminating from the personal relations of people

in the selling and buying organizations.

There is the question of what we shall say, to whom we shall say it, and how we shall say it. Our prime motive is to secure an order.

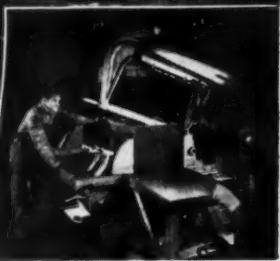
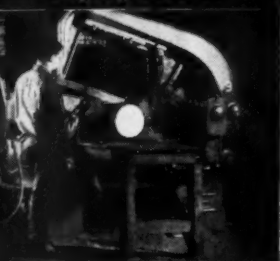
Let us think of the way we present ourselves and the way we make an inquiry or a statement. The distributor's salesman is sometimes given credit for asking a question equivalent to "Any oranges, apples, or potatoes, today?" The pitiful thing is there are a few who present themselves in just this manner. There are also direct salesmen for the builders who have the same presentation, but it is more limited because they only offer the one item of apples. Each of us sees the half-hearted approach of this question.

Before we cross the threshold of a plant we should know our reason for entering this plant. The order we want for a machine tool is a prime reason, but we know there are also the problems of how and when we will get the order, and how much time we must use to get it. There are many stories about the plumber forgetting his tools. We too, can forget our tools. We forget our tools when we have not given some thought to our call. We should have our tangible tools of catalogs in order for easy handling, and our most important tools—our ideas. When these tools are in order we automatically talk

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Photos Courtesy Kropp Forge Co., Chicago, Illinois

where jobs
Challenge
equipment

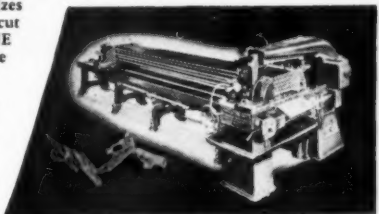


CUTTING 20" DIE BLOCK

RACINE MACHINES get out the work . . .

Out on Chicago's west side, the Kropp Forge Company puts RACINE Heavy Duty Hydraulic Metal Saws to a real performance test. In this modern forge shop, billets and blooms are cut to proper lengths for forging. Finished forgings are sawed to specified dimensions in a wide range of sizes and steel grades. Huge die blocks are also cut to working size as shown to the right. RACINE Automatics are used for high speed multiple cutting work.

RACINE'S line of metal cutting saws is complete. They are hydraulically operated to assure smooth, oil-cushioned, positive and efficient cutting of any metal. Models are available in a wide range of sizes from 6" x 6" to 20" x 20" capacity. Write for Catalog No. 12. Address Racine Tool & Machine Co., 1754 State St., Racine, Wis.



RACINE AUTOMATIC

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The TRANSA

GUN TYPE SAW



At last, a saw which cuts anything, stainless steel, rubber, wood, aluminum, etc. Blade has a variable speed which is set in 45 seconds . . . the stroke length of the blade is adjustable depending on thickness of materials. Transa has

twice the power on the cutting stroke due to a special gearing arrangement.

Special guides for each width of saw blade eliminate whipping, turning or cracking the blade, and acts as a cutting

guide at the same time. Transa guns are used extensively in machine shops, assembly plants, fabricating industries, repair and shipping departments.

Write for free bulletin.

TRANSA INC.

440-45 Gateway Bldg.
Minneapolis, Minnesota

optimistically and have an air of good will on our being.

When we are prepared for the task of calling on a customer we find our customer respecting our ability, the company we represent, and having confidence in us and our company's ability to do the customer a service.

We can usually get a customer to listen when we discuss a good tool and tell of the tool's fine features. We arouse the customer's interest when we tell what the fine features will accomplish for the

customer. The story of the potential results to the customer goes far deeper into the mind of the customer than does the story of fine features. We may find the customer's interest aroused so that he is seeing results which we had not covered. When we have aroused the customer's interest so that he not only sees results which we mention but sees additional benefits, we have made substantial progress.

There is the "canned sales talk" which seems to fit into the points which have been enumerated.

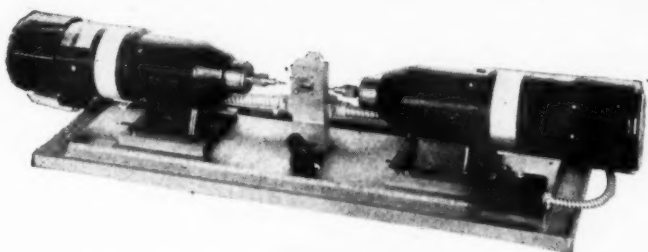
The canned talk is predicated on quickly training inexperienced sales personnel to present a story to even less experienced purchasers, who can be bowled over by the sheer volume of words. When we sell machine tools we are not dealing with inexperienced buyers who are bowled over by a flow of seemingly logical reasoning.

The canned sales talk depends on continuity of story which when interrupted throws the whole story off the track. All of us know machine tool buyers have more than one positive idea and their ideas cannot be effectively dealt with in the canned sales talk.

Our talk must be developed step by step to allow for our customer's reactions so that we may meet his doubts, answer his questions, and solve his problem.

When we put across one idea at a time

(Please turn to next page.)



Automatically Tapping Two Opposed Holes Simultaneously

•

THIS 2-way bench fixture, which we recently designed and built, incorporates 2 Model "KT" Govro-Nelson Automatic Tapping Units which tap two opposed 8-32 holes simultaneously in a metal lamp part (shown on base).

When the part is located by the operator, it actuates a micro-switch, causing both Units to tap simultaneously. Tapping time: One second. Output: As high as 1800 per hour, depending upon operator efficiency.

If you have similar operations, send samples and part prints and we shall be pleased to recommend the proper Automatic Units or quote on a complete set-up. Literature sent upon request.

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Literature

GOVRO-NELSON CO.

*Machinists of Precision Parts
for 25 Years*

1933 Antoinette, Detroit 8, Mich.

Automatic

DRILLING UNIT



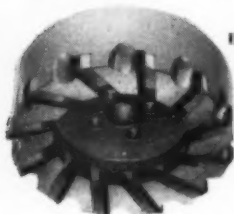
SIDE MILLS

3" to 6" stocked*



SHELL END MILLS

1 1/4" to 6" stocked*

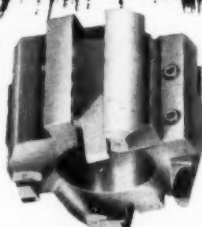


**INSERTED
BLADE
FACE
MILLS**

4" to 14"
stocked*

FROM THE MOST COMPLETE
STANDARD CARBIDE
TOOL LINE —

CARBIDE MILLING CUTTERS FOR EVERY JOB



ROTARY BROACHES

4" to 6" stocked*

*Specify material to be machined

STANDARD
AND SPECIAL

SUPER Carbide Tools

SUPER TOOL COMPANY

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to answer the customer's questions we are approaching conviction and action on the part of the customer.

We must be careful in suggesting ideas to a customer, not because they are new to him, but we must be careful in the manner in which we present them. The customer is, as a rule, open to suggestions provided the suggestions are constructive. When we venture into the field of comparison of the customer's processes and our suggested processes there is a possibility that we may become tactless

and be derogatory of that which we see, when comparing it with the machine we hope to sell. It is in this field of comparison that we can become insulting in the way we present our story. It is well for us to remember that we must be tactful and present our story in a friendly way and not belligerently. Lack of tact or consideration has many times delayed, if not prevented, the placing of an order.

After we leave a customer, it is time for us to reflect on the results of our visit. We should ask ourselves—

1. Did we irritate the customer by taking time when he was crowded for time?
2. Will the customer forget or remember our visit?
3. What will the customer remember, the story, the golf anecdote or the purpose of our call?
4. Will the customer take favorable action as a result of our call?

There is only a portion of each day which we as salesmen can use to present our story to the customer. The customer has only a portion of each day which can be used to listen to salesmen. There are a few plants which have restricted hours for salesmen. There are plants were either the morning or afternoon provides the most suitable time to call. There are plants, usually small ones, where an early morning call or a late afternoon call can be made. A few plants, usually the large ones, can best

(Please turn to next page.)

Blind Operator ...

HONES 183 WRINGER GEARS PER HOUR



On the **SUNNEN** PRECISION HONING MACHINE

Case hardened gear—
hole diameter .6220",
hole length $\frac{1}{2}$ ", maxi-
mum tolerance .001".

... at The Maytag Co.
Newton, Iowa

THREE TIMES EVERY MINUTE each operator takes a completed wringer gear off the mandrel of a Sunnen Honing Machine. The internal diameter of this case hardened gear is honed to a smooth finish: straight, round and accurate.

At Maytag five other parts are production honed to produce smooth, accurate internal diameters; to remove heat-treat distortion; to remove burrs—and

to lengthen the service life of rotating parts.

When you use Sunnen Honing, set-up time is fast, less than 5 minutes. Skilled labor is unnecessary. Operators, even girls, can be trained in an hour or less.

If your specifications call for finishing of internal diameters from .120" to 2.625"—accuracy to .0001", extremely smooth finish, it will pay you to investigate Sunnen Honing.

Write for booklet XSP-5, or, on request, a Sunnen engineer will call at your plant.



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Exclusive
"Tru-Grip"
Tap Holder
is lighter,
smaller in
diameter.

This Tapping Head

CUTS PRODUCTION COSTS!

Reduce labor costs and cut down tap breakage with Procnier High Speed Tapping Equipment. Check these unusual advantages!

Accurate, high speed tapping. Procnier tap heads will give you cleaner, sharper threads . . . in less time, with less spoilage.

Fewer broken taps. Friction clutch regulates tap driving pressures, operators quickly detect dull or "loaded" taps . . . avoiding costly tap breakage.

These and many other **proven** exclusive features assure you of fast, accurate tapping . . . reduced production costs.

Cross section of tap holder (at left) shows how tap is held by the round, driven by the square . . . tap shanks are never "chewed up."

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CIRCULAR

Procnier

Safety Chuck Company

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Chicago 6, Ill.

Procnier Safety Chuck Co.,
14 S. Clinton St., Chicago 6, Ill.

Gentlemen: Please send me your illustrated brochures which give complete prices and specifications on Procnier High Speed Tapping Heads & Machines.

Name

Address

City..... Zone..... State.....

lobbies is reduced to a minimum. In this way we can call on the greatest number of customers.

Machine tools are products that are rarely sold as a result of one call. Our problem is to present our product in such a way that a minimum number of calls is required to secure an order. Then when we have planned our calls so that we can contact the greatest number of customers in a day we will be well on our road to the success we all hope for.

There may be a few of us who wonder where the salesman noted for certain pronounced habits fits into the picture. When we study this colorful personality of pronounced habits, or any successful salesman, we find that he is a success when—

1. He knows what he wants to sell.
2. He knows what he is selling.
3. He knows where to go to sell it.
4. He knows how to get access to people who buy.

5. He knows how to talk to people who buy.

6. He knows how to build up towards an order.

7. He knows when he has made a sale, and keeps quiet.

All of us can master these seven basic points but we know we must be careful of the "colorful" performance. Each one of us has seen more than one man decline because of the color being overdone to the point where this salesman was obnoxious to a customer.

be visited after making a telephone call for an appointment with a resultant saving of our time and time of the customer's personnel.

There are territories where there are only a few or perhaps only one customer in a town and there is the other extreme of a large town with many customers. By forethought when these points are considered, we can plan a day so that the beginning and the end of the day are used for calls, our traveling time between calls is short and our waiting time in

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* Here at last! The Conventional type Thread Milling Machine that produces long and short precision traversing, elevating, cross-feed and lead screws in LESS TIME!

Get the whole story today . . . then CHECK and COMPARE. It's COULTER all the way!



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COULTER
Machine Co.

MORE DEPENDABILITY

Anti-Friction Bearings and Spiral and Worm Gears in Cutter Spindle Drive.

MORE EFFICIENCY

Full-size spindle and balance wheel on both ends of cutter spindle drive.

MORE CAPACITY

59 speed changes possible with standard equipment. Cut threads from 1/3 to 20 per inch and diametral leads from 7 to 20 in single, double and triple worms, and leads from .050 to 3.000.

MORE ACCESSIBILITY

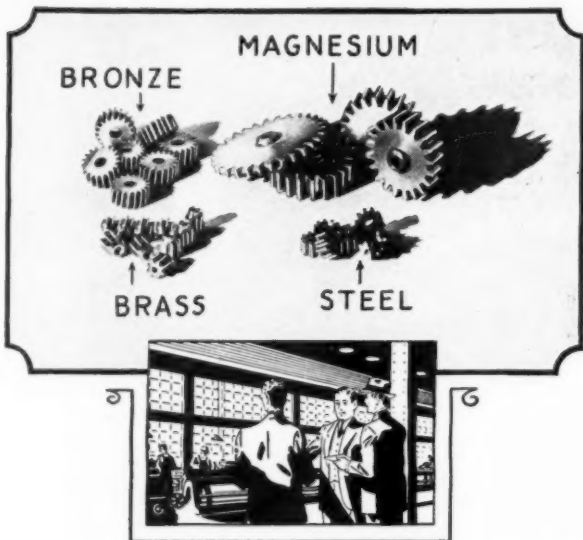
All speed and feed changes within easy reach of operator for quick change over.

MORE PRODUCTION

Mill hard and soft materials with carbide tools.

These are reasons enough why you need the Coultter THREADMASTER . . . the Thread Milling Machine of tomorrow . . . threading it better and faster, today!

BRIDGEPORT, CONNECTICUT



We Study Our Customers' Needs

Perhaps that is why so many of them remain with us so long. When replenishing our wire and rod inventory, we keep our customers' needs in mind. As a result, besides being able to meet their regular needs promptly, we can usually give them quick service when time to them is money.

Having served American industry through two major wars and one major depression, we have built up a back log of manufacturing experience and business connections. This enables us to keep abreast of developments in metals and alloys and their fabrication. Above is a typical illustration showing four sizes of gears made of four different materials. We have adequate equipment of the most modern type to manufacture these products.

Send Us Your Orders

for screw machine products now—also for springs. We are able to give you prompt service, plus engineering assistance if you need it.

PECK

SPRINGS & SCREW MACHINE PRODUCTS
THE PECK SPRING COMPANY

10 GRAND STREET

PLAINVILLE, CONN.

Improved **SELLING TECHNIQUE** FOR MORE SALES



Lecture No. 3 **ANALYSIS OF CUSTOMER PERSONALITY**

by
Dr. A. L. Winsor
Director, School of Education, Cornell University

HOW TO UNDERSTAND YOUR CUSTOMER

The strengths and weaknesses of customers must be determined by the salesman. Appeals must be made to desires. The salesman's product must satisfy one of many desires the customer may have. Three good commandments for the salesman to follow are: know our goods, know your customers, know yourself. Good salesmanship can be measured by the extent to which these commandments are obeyed.

SINCE effective selling begins with the point of view of the customer, the most important qualification of the salesman is a comprehensive understanding of human behavior. He must know how and why people do the things they do. He must establish rapport with his prospect and determine what his needs are, or create and sharpen new desires. It makes little difference whether the product he offers is food, services, or tools,—success in its disposal involves an understanding

of personality and the art of influencing people.

Psychological studies have shown that people resemble each other more in primary factors such as reflexes, feelings and emotions, and differ most in such secondary elements of personality as interests, attitudes, values, and knowledge. However, it is the secondary factors that play the greatest role in both the selling and buying of industrial tools. To be successful, the salesman must evaluate

each customer against this background of differences in human characteristics and develop the profile of the person to whom he is to address himself. The poorest salesman is the person who approaches all customers with the same technique or set speech. Just as no two persons are alike in appearance, voice or mannerisms, no two persons are alike in those characteristics which determine their response to a sales appeal. The successful sales person is the one who treats every customer as if he were a personal case, the only customer existing for the time being, and the salesman must be prepared to understand and to satisfy him. Salesmen of industrial tools will never be called upon to sell to the human race or even types of it, but to a particular person, in a particular situation, in a definite frame of mind.

The person who would influence behavior most must be an artist in determining the strength or weakness of his client's ability, the relative dominance of his urges, the amount and nature of his education, the strength of his sentiment or feeling about significant situations, things or people, the characteristics of his likes and dislikes, the power of his prejudices and the pattern of his values.

Personality as such cannot be measured. We can only make the best evaluation possible of some dimensions of personality which play a role in human performance. One of these dimensions is ability. Man's level of intelligence plays as important a role in what he does and how he does it as any single factor. Both the amount and nature of his mental ability are significant. His degree of brightness or his mental age is more important than his chronological age in determining how he will react. Whether mechanical, verbal or social intelligence characterizes his activity is as important as any variation in his physique, as far as personality is concerned. Fortunately for us in our limited time we can assume that the buyer of industrial tools must be relatively intelligent. The complexity of his problems demands a degree of mental performance that places him well above average in ability to understand and evaluate. Furthermore, he will probably possess a mechanical, practical type of mind, capable of comprehending mechanical operations and values. On this assumption the salesman will pitch his appeal on a high level while still avoiding an academic approach.

An equally important dimension of personality, often playing a more important role in customers' responses, is man's motives, desires, urges, or wants. Whatever term you may choose to call them, man's desires are the dynamics in his activity. Whatever level a salesman chooses to use as an approach, whether his appeal is to an appetite, a habit, or to reason, the commodity he is selling to the customer must satisfy a desire or want. Human desires and their satisfaction are the fundamentals upon which all selling must be based; hence a knowledge of their nature is essential to any systematic attack on the customer's personality.

Unfortunately, the motives of behavior cannot be readily discovered, classified or laid down by rule or formula, but must be investigated anew for each individual and each situation. The same man may be motivated differently at different times. A book which pleases a man during a lazy vacation may not satisfy him in his work-a-day environment. Furthermore, the type of book which satisfied his last vacation may not be satisfactory this year. As we grow older, we outgrow appeals.

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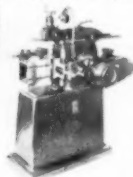
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THE NEW PRECISE 40

We can assume that the customer with whom we are concerned has many of his basic desires satisfied. His desires to eat, to drink, to rest, to sleep or to play are taken care of as a matter of course in our culture. It is those secondary desires that are aroused as the result of interaction with other persons with which we are concerned, and not those mentioned above that function as the result of bodily needs. Such secondary desires as the urge for success, the desire to possess or own, to obtain prestige, to be independent, the desire to assert oneself, the desire to be liked, or to belong, to

then be found whereby the customer will see the tool to be sold as a means of furthering this ambition. Once this is done, the sale can soon be consummated. We go after what we need and haven't got.

In another case, ambition or prestige may still be the dominant motive, but its expression is cleverly concealed. The desire for success may be in conflict with another urge such as the desire for social approval, and the group with whom this customer works frowns on ambition. The basic urge may then be frustrated. When (Please turn to next page.)

be with others, to have security, or the desire to explore—are the dynamic wants with which the seller of tools needs to cope.

These urges do not express themselves as independent drives, but rather in combination. In a given situation, several or many drives may be involved. We do not buy a car to satisfy the need for transportation alone; we may buy it to enhance our prestige or social status. It is the problem of the salesman to assess each buyer, to see what drives or combination of drives are dominant in his thinking at the moment, and then to sharpen his appetite for the company product and create a sale. A short conversation with the customer may reveal to the clever salesman a desire to get ahead which may be displayed in numerous disguises, but which dominates all other desires at the moment. A way must

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though hidden desires, but he must note the habitual ways in which the customer resolves his conflicts. Consciously or not, we either remove ourselves from conflicts or solve them in a fairly definite pattern. Some of us do the job much better than others.

When society frowns on natural ways of responding to basic urges such as sex, we find substitute channels of securing satisfaction, or we change our methods of expression to obtain social approval. Thus nature helps us save face. A second way of resolving frustration might be by compensation. For a homely face we substitute a charming smile or expensive clothes to gain the approval we desire. Or we may rationalize. We all rationalize at times. We save our ego by offering an alibi. "The sun was in our eyes." If the sales effort fails, it was because the customer didn't treat us fairly—the competitor

had a "drag," or the customer doesn't know what he wants. Rationalization is one of nature's kindest devices. To take the blame for our many blunders and mistakes would keep us in a perpetual state of annoyance, if not unhappiness, but when we rationalize, we can put the blame somewhere else, and the hurt is gone. The salesman must try to differentiate rationalization from reality.

Other types of reaction are not so simple or satisfying. We may repress our response to urges and develop feelings of

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one desire or motive of the individual is inconsistent with another, we say that the two tendencies are in conflict. Conflict may disrupt mental life and destroy its inner harmony. Conflicts are very common, and are frequently unpleasant, but we all have them. Our desire to be a hero is in conflict with our fear of getting hurt. You can't have your cake and eat it. So we resolve the situation, we "make up our mind." In fact, we develop characteristic ways of making up our minds that become habitual. The salesman must only try to identify dominant,

he flunked his test!



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inferiority which may profoundly influence our personality, if not our stability. We may find ways of escape such as using drugs or alcohol, thus avoiding annoying states of affairs. Whatever our mode of resolving conflicts, the person who would understand us either as a customer or a salesman, must be able to see behind the maze of superficial reactions and identify the real motives and responses. Often these false fronts are more significant in our reputations, if not our personalities, than any other phase of our behavior. To understand customer per-

sonality, the salesman must look behind the superficial and see the reactions to motives for what they are. The fact that a motive is hidden or concealed or repressed doesn't subtract anything from its dynamic role in determining ways of acting or creating characteristic traits of behavior.

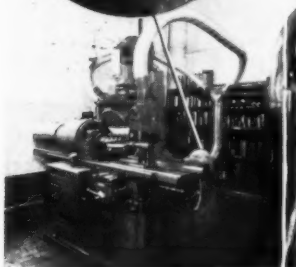
If, after a careful study of a client, it is found that his urge seems to be social approval, the successful salesman simply indicates to him that the best firms are using his product. If his dominant urge is thrift, he will be shown how the product will save him money. If he is altruistic, he will be shown how the product will enable him to render greater service. In face to face sales relationships, the wise salesman picks up many clues from expressions and movements that are invaluable in his analysis of personality and determination of needs.

As important as man's basic urges and closely related to them are his interests and values. An interest is difficult to describe, but it seems to be the feeling which accompanies some activity in progress. If the tone is pleasant, we tend to repeat the activity, and if it is unpleasant, we tend to avoid it. We cannot concern ourselves here with the origin of interests and values, which may be very complex, but we are more concerned about their identification and the role they play in personality. If a salesman expects to hold the

(Please turn to next page.)

Hob Grinder gets Roto-Clone treatment

**Roto-Clone Self-Contained Unit brings high efficiency
dust control to isolated operation**



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ROTO-CLONE* dust control is as flexible as an old shoe. Although in an isolated location, hob grinding on this Barber-Coleman hob machine was converted into a dust-free operation quickly at low cost with the installation of a Roto-Clone Self-Contained Unit.

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Whether your dust control problem involves one machine or scores of them in various locations and groupings, there's a Roto-Clone of a type and capacity that assures you highest collection efficiency at low cost. For complete information on Roto-Clone dust control equipment, see your local AAF representative or write to—

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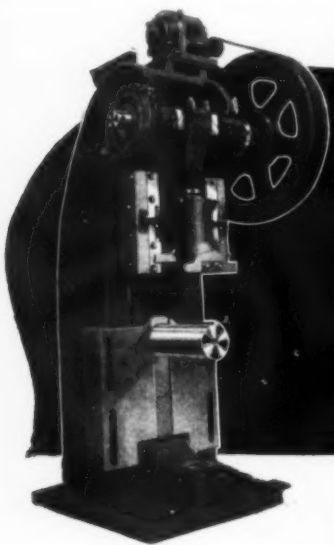
**ROTO-CLONE®
DUST CONTROL EQUIPMENT**

attention of a customer, he should determine roughly his interest pattern, his likes and dislikes. He should know if he is primarily interested in people, in things, in business, in athletics, in religion, in social service, or in art. Every clue that gives some idea about the interest profile should be eagerly sought and wisely considered. The salesman must be particularly alert to see what the customer likes about other men. On the other hand, strong prejudices or dislikes in individuals should be identified as soon as possible, if face to face relationships are to succeed. Perhaps no two of us are exactly alike in our dislikes, but there are a few that are very com-

mon because they interfere with the expression of our fundamental motives, our ego. Most of you have had experience with the salesman who comes into your office and spends five minutes telling how well his car performed on the way in. He doesn't know it, but he might as well come in and bowl you out as far as good relations are concerned.

In that respect, customers are alike. To belittle a person, either directly or indirectly, through speech or mannerisms, is as damaging to sales relationships as pushing him off a diving board.

More dynamic than interest profiles are



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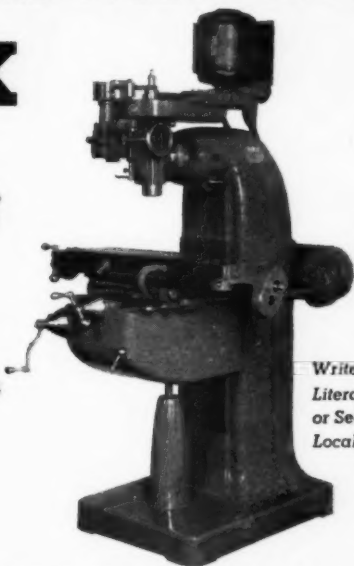
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patterns of values in determining behavior. Since they develop from experiences, customers show great differences in their system of values. This system seems to be largely determined by one's early environment. The salesman himself is a builder of values, either good or bad, but most of all he is an interpreter of values and desires. He must see these indomitable forces in the customer, and find a way to satisfy them. Everywhere and always, these energies strive and press for satisfaction. They break through all barriers; they find new ways; they will not stop. They are the powers within man which have created the machines, the tools, and the institutions that symbolize progress.

The salesman is concerned with influencing the behavior of others. To do that, he must know himself and be able to control his own behavior first. It is what he is that speaks much louder than what he says.

Daniel Starch once asked 600 persons, representing a wide cross-section of the general population, to make a list of their favorite statements, quotations, or maxims, which they had found valuable for their conduct. When all of the statements were in, two stood head and shoulders above all the rest. One is from Jesus, and the other is from Socrates. The Golden Rule came first, "Know thyself," second. In the Golden Rule is the principle of reciprocal behavior—reciprocity. It was not discovered by science or experiment, but has grown out of the experiences of many generations in every civilization.

Today's salesman must be aware of:

1. The ways in which people differ in feelings, interests, emotions and ways of thinking.
2. Their level of mental ability.
3. Their fundamental desires and wants and values.
4. The various ways in which their psychological traits may be thrown into personality patterns.
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- Know your customer.
- Know yourself.

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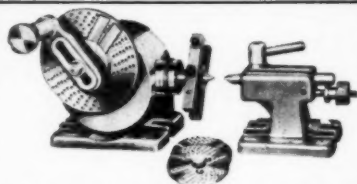
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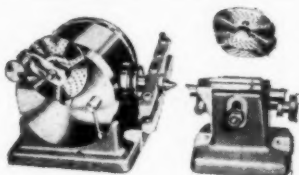
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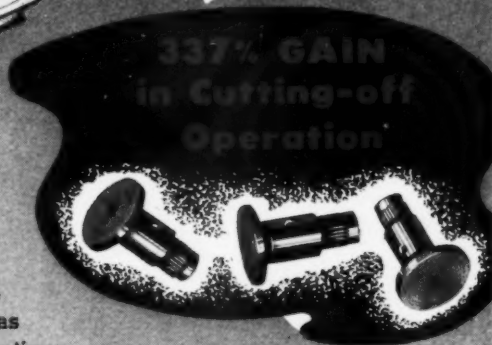
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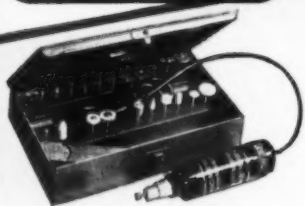
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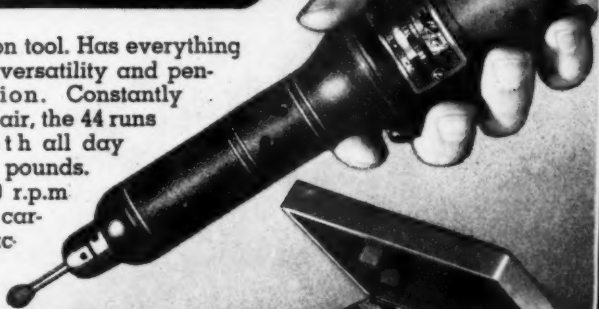


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**BECAUSE *American* ANSWERS
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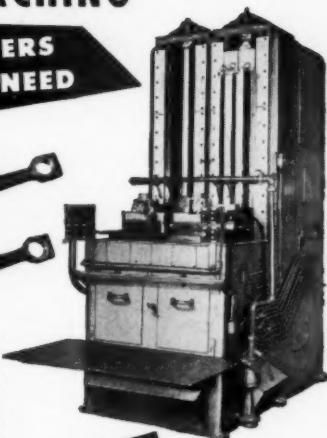
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Above: Automotive spindle support. *Top view:* After broaching; *bottom view:* before broaching. Inside and outside lug surfaces are broached at a rate of 240 pieces per hour net.



Above: American SBD-48-15 Vertical Hydraulic Broaching Machine with dual hydraulic receding work tables and dual push button controls (a safety measure). Automatic jack supports are provided under the part lug to compensate for irregularity of part.



PART: Automotive spindle support.
OPERATION: Surface broach inside and outside lugs.
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MATERIAL: Steel forging.
STOCK REMOVAL: $\frac{7}{16}$ " stock per face.
TOOLING: Two single station fixtures provided for each run.
FEATURE: Each fixture designed to accommodate either right or left-hand part.

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A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

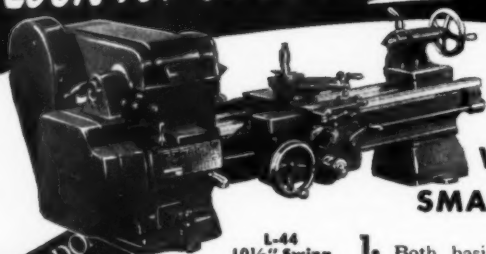
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13 1/2" Swing
Lathe

SHELDON MACHINE CO. Inc.
2245 W. 83RD AVENUE • CHICAGO 41, ILLINOIS, U.S.A.

What's New in **METALWORKING**

SINGLE SPINDLE HYDRAULIC HONING MACHINE DEVELOPED BY C. ALLEN FULMER CO.

A new, small size single-spindle hydraulic honing machine, the Fulmer Model 412, has been added to the line of vertical hydraulic honing machines produced by the C. Allen Fulmer Co. This new machine has been developed after numerous requests from manufacturers for a small size hydraulically operated honing machine suitable both for general purpose work and production runs on small parts. The Fulmer Model 412 is designed for rapid, accurate honing of any type of internal cylinder ranging from $\frac{1}{2}$ " to 4" in diameter, such as aircraft and automotive cylinders, sleeves, bushings, bearing housings, drill bushings, air and hydraulic cylinders, etc.

The Model 412 machine has a maximum honing stroke of 12". Reciprocation is by means of a hydraulic cylinder, allowing any reciprocating speed from 0 to 80 f.p.m., regardless of the length of stroke setting. The reciprocating speed is constant throughout the entire stroke. Reversals at each end of the stroke are smooth and shockless, and the reciprocating mass is hydraulically counterbalanced. Hydraulic power is supplied by a Vickers vane



pump driven by a 3 h.p. motor, and through the use of oversize hydraulic lines and an adequate hydraulic reservoir; the efficiency of the system is very high.

ERRINGTON

TAPPING CHUCKS

Capacity No. 10 to 5/16

- Both chucks are equipped with Jacobs Rubber Flex Tap Chucks
- Rigid, Sensitive, Quick-reverse, with self-centering, double grip Tap Holder
- Supplied with No. 1, No. 2, No. 3 M. T. No. 2 or No. 33 Jacobs Socket Shanks

Other Sizes up to 2"

Write for Bulletins on Auto-opening Die Heads, Clutch Tappers to 2" tap, Cone Tappers to 3/16" in steel—1/4" in cast iron.

ERRINGTON MECHANICAL LABORATORY, INC.

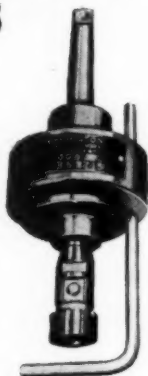
Established 1891

Main Office & Plant:
Staten Island 4, New York

Chicago Office
6701 N. Sioux Ave.
Chicago, Ill.

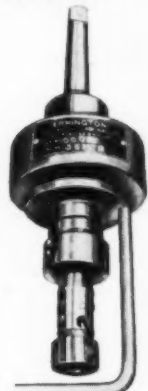
California Office
P.O. Box 543
Alhambra, Calif.

AUTO-REVERSE
SUPER SENSITIVE
HIGH SPEED



No. 00B Positive

\$40



No. 00C Friction

\$45

The spindle is driven by a separate 3 h.p. motor, so that an excess of power is available for any work within the machine's capacity. The machine has three spindle speeds, obtained through the use of cone pulleys and a V-belt, with the output pulley driving a set of alloy-steel reduction gears mounted on oversize Timken bearings. The gears and bearings run in an oil bath with oil seal protection against the inclusion of foreign matter. Power is transmitted to the heat-treated alloy steel spindle through an aluminum bronze splined driver. The spindle is 1 1/4" in diameter, splined, and has a No. 3 Morse taper in the nose to fit conventional production type honing tools.

The working table is 18"x24" in size, with tee slots for 5/8" bolts, and is so placed that the machine can accommodate work pieces up to 21" in outside diameter. The table is at waist height, for maximum operator comfort. Controls are all located on the front of the machine in the form of a push button bank. Space is available in the

control bank to accommodate additional buttons for operating the patented Fulmer "Stop and Dwell" mechanism for honing blind holes, or automatic fixtures, should these items be required on the basic machine.

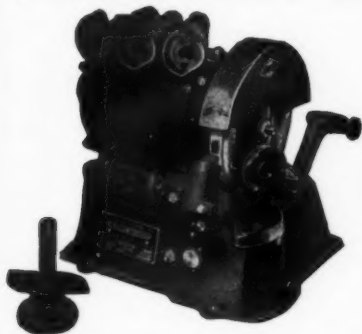
A welded steel base contains the electrical and hydraulic equipment. A compartment in the base houses the hydraulic reservoir, and in it is mounted the Vickers pump and filter, with the pump motor mounted on the rear of the machine. Another compartment in the base contains a 45 gallon coolant reservoir which permits work of close uniformity to be produced on the machine, since the temperature rise of the work piece is negligible. The coolant is delivered to the work by a 1/10 h.p. Ruthman motor-driven coolant pump.

The Model 412 machine occupies 41" x 48" of floor space, is 100" in height, and weighs approximately 2500 lbs. Particular attention was given to reducing the number of working parts to absolute minimum. With the acquisition of the Model 412 Honing Machine, even

◆ BLACK DIAMOND ◆

PRECISION GRINDER for ALL SMALL DRILLS

● No Mechanical Skill Needed To Grind Drills Accurately ●



ANYONE can operate a Black Diamond. Even the most inexperienced can keep all small drills sharp and true centered, with smooth lips accurately ground to exactly the same length—at the proper angle and with correct clearance for fast, precision drilling.

Black Diamond Grinders cut 50% and more on drill grinding costs, sharpen without waste of expensive drill stock, reduce drill breakage and especially work spoilage to a minimum.

The built-in Diamond Point Dresser keeps the grinding wheel ever-sharp and the Web Thinning Attachment cares for all types of Notched points to perfection.

Whether you use drills singly or in gangs—by hundreds or thousands—this moderately priced machine—motor driven—will keep any supply quickly available.

WRITE FOR NEW BULLETIN—TODAY

BLACK DIAMOND SAW & MACHINE WORKS, INC.
45 NORTH AVENUE NATICK, MASSACHUSETTS

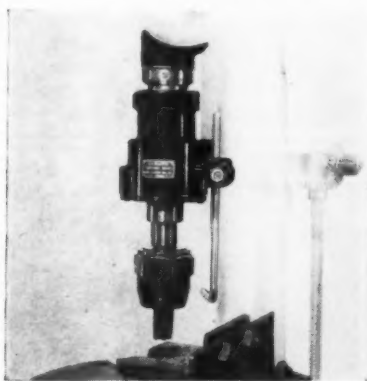
small shops will have available facilities for the production of highly accurate round, straight bores, to any desired surface finish, within a fraction of the time required for other machining processes. For complete operational and structural details, write:

C. Allen Fulmer Co., Dept. BB
1242 First National Bank Bldg.
Cincinnati 2, Ohio

DORMAN HEAVY DUTY TAPPING ATTACHMENT

A new model, heavy duty, automatic reverse Tapping Attachment for $\frac{3}{4}$ " to 2" pipe taps and standard hand or machine screw taps has recently been introduced by Dorman Machine Tool Works, manufacturers of single and multiple spindle tapping attachments and drill heads. The new device is equipped with positive gear drive and an automatic reverse, for use in back geared drill presses. The tap holder of the attachment is the collet type. The tap itself is held by round, and driven by square. The unit is said to

be particularly suitable for long run production tapping using larger taps.

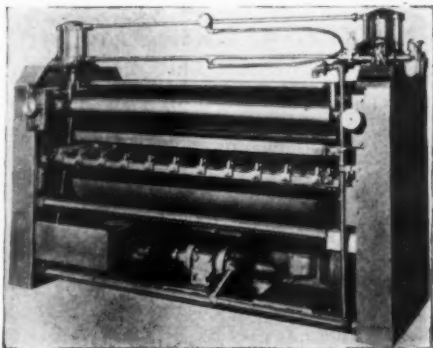


For complete information, write:
Dorman Machine Tool Works,
Dept. BB, 38 S. MacQuesten Parkway
Mount Vernon, N. Y.

ROLL-COATING MACHINE FOR APPLICATION OF DRAWING COMPOUND

Many changes have been made in the application of drawing compound to replace the hand brush and spraying methods. Hand brushing of compound has proved to be inefficient because of partial application and excessive use of compound. Spot spray of the blank is sometimes objectionable because of the oil fog that is thrown up around the press. In addition, this method provides an uneven coating in a limited area with a rapid fade to the edges of the blank.

In addition to preventing fracture or excessive strain marks on the part being drawn, overall lubrication materially decreases die wear, saving repair work and shut-down time. Lubrication of the wearing parts on the die is present when metal flow is started, rather than relying on the pressure of the die to spread the compound.

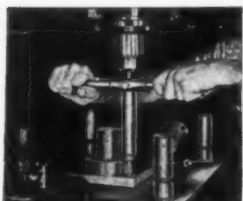


The development of a special roll-coating machine for drawing compound has eliminated many objectionable features. This machine assures a uniform and economical application of compound to either one or both sides of the

LASSY UNIVERSAL TAP & DIE GUIDE FIXTURE



Guide, removed from fixture, in use threading



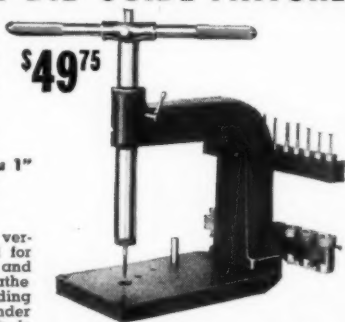
Guide, removed from fixture, in use tapping

Complete as shown with 12 adapters, No. 5 thru $\frac{5}{8}$ "

(taps not furnished)

Capacity No. 5 thru 1" Pipe taps to $\frac{5}{8}$ " Dies to $1\frac{1}{2}$ " O.D.

This new, handy versatile tool is ideal for all hand tapping and threading. On the lathe tapping and threading can be done under power. Large work is tapped right on the drill press without juggling it around. Attaches to wall or bench. $12\frac{3}{4}$ " x $6\frac{1}{2}$ " x 17"; wt. 32 lbs.



\$49⁷⁵

Send for free circular:
"Short Cuts to Tapping and Threading"
From your mill supply house or

LASSY TOOL COMPANY 108 Bohemia Street, Plainville, Conn.

Complete line of Bench and Floor Tapping Machines.

blank just prior to its insertion in the die cavity. This method offers many possibilities for mechanical or automatic feeding which tends to eliminate double handling of the blank and permits the press operator to feed the blank to the die through the roll-coating machine.

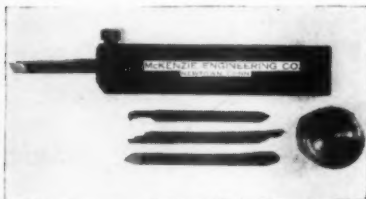
Drawing compound may be applied in any desired quantity through the use of a controlled spreading roll. Thickness requirements vary from a very thin spread for drawing compounds with a plastic base to a more generous application of the water soluble and soap borax types. Sheets up to $\frac{1}{4}$ " thick and of any length may be coated on these machines in widths ranging from 24" to 72". Further information may be obtained by addressing your inquiry to:

Bertsch Machinery Co., Dept. BB
2832 E. Grand Blvd.
Detroit 11, Mich.

ALL PURPOSE LATHE TOOL HOLDER

This McKenzie All Purpose Lathe Tool Holder takes the place of four separate tool holders — for boring, threading, cut off and turning — using the full length of the tool bits instead of cutting off part to suit the holder.

Tool bit number one in the holder is for boring and needs no forging, just grind the end. As it is very rigid there is no springing away from the bore.



Tool bit can be set back from shallow holes and for tapers, like sample, down to one-sixteenth inch drill hole. The second tool bit has one end ground for regular thread cutting (straight on top as it should be) and the other end ground for inside thread cutting. The

ARGUTO
OILLESS BEARINGS

USED

ALL OVER THE WORLD

... IN MANY DIFFERENT APPLICATIONS

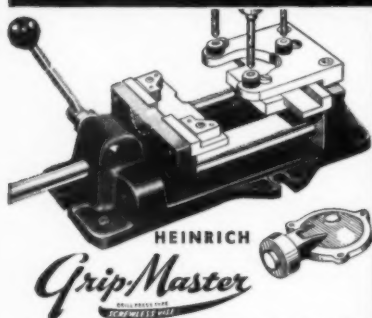
"OUTWEARS THE BEST BRONZE METAL"

20 years



ARGUTO OILLESS BEARING CO.

2 TIME SAVERS



This Amazingly Fast Drill Press Vise May Also Be Used as a Base Structure for Jigs & Fixtures. This unique screwless vise provides instantaneous, effortless setting. Patented gripping mechanism guarantees positive locking. Wide clearance between guide bars permits clear-through drilling. Built-in parallels save leveling time. Write for folder.

USE HEINRICH HANDNIB No. 5 for

- ✓ Outside Nibbling
- ✓ Inside Nibbling
- ✓ Shearing
- ✓ Punching
- ✓ Red Cutting



A five-in-one "handyman" which nibbles (outside and inside), shears, punches and cuts rods. Eliminates hours of tedious hand work. Quickly, easily cuts templates and trial blanks in any desired shape. Takes up to $\frac{3}{8}$ " flat stock. Also $\frac{3}{8}$ " round stock. Write today for illustrated folder.

NATIONAL MACHINE TOOL COMPANY
DEPT. 108-K • RACINE, WISCONSIN

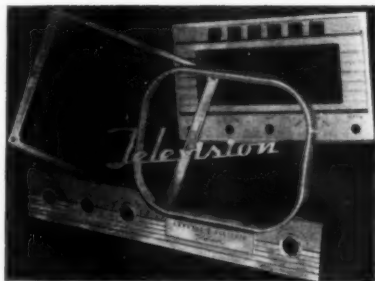
tool bit can be removed to regrind without disturbing the setting of the tool holder. The third tool bit is for regular cut off with a narrow and a wide end. The fourth tool bit has one end for turning steel, etc., and opposite end without rake for brass and bronze.

The McKenzie All Purpose Lathe Tool Holder is made for $\frac{3}{16}$ " and $\frac{1}{4}$ " tool bits. Larger sizes on request. Ideal for bench lathes and larger ones such as S.B. Write:

McKenzie Engineering Co.
Dept. BB., Newtown, Conn.

NEW TELEVISION PARTS

Television set producers are adding eye-appeal to their cabinets by means of decorative metal escutcheons and trim. The pieces illustrated, and similar items, are being produced by the American Emblem Co., Inc., for Crosley, DuMont, General Electric, Philco, R.C. A., and other television manufacturers. The final designs and finishes represent the combined effort of the cabinet designers and the Emblem Company engineers, resulting in the ultimate of impressive beauty and manufacturing economy. These are typical of the wide



variety of nameplates, insignia, emblems and decorative metal parts this company produces for all types of industrial and commercial applications. For additional data on these items, write:

American Emblem Co., Dept. BB
P. O. Box 116-P
Utica 1, N. Y.

CARLTON SUPPLIES:
RUTHMAN
GUSHER
COOLANT PUMPS
as standard equipment on
their radial drills.

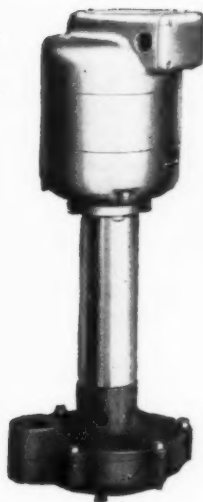


Photo Courtesy
The Carlton Machine Tool Co.
Cincinnati, Ohio

Yes, more and more of the leading machine tool manufacturers all over the country supply Ruthman Gusher Coolant Pumps as standard equipment on their machines. They have learned from experience that Ruthman Pumps give their customers long service, low maintenance costs and efficient operation at all times.

So follow the leaders in the industry, specify Ruthman Gusher Coolant Pumps on your metal-cutting machinery.

Illustrated above is a Carlton Radial Drill equipped with a Model UL Immersed type Gusher Coolant Pump.



THE RUTHMAN MACHINERY CO.



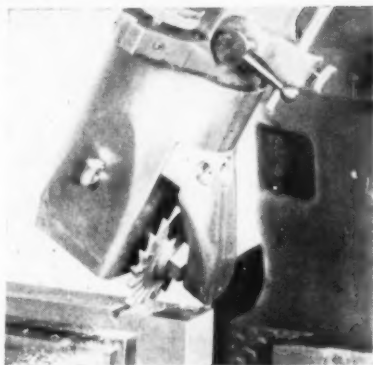
1817 Reading Road

Cincinnati 2, Ohio

VERSATILE MILLING MACHINE ATTACHMENT

A recently-developed auxiliary, precision horizontal milling attachment which increases the scope of vertical milling machines and other machine tools has been announced by the Bemis & Call Co. This new milling head converts a single-purpose machine into a multiple-operation unit, both by increasing the machine's productivity and by eliminating expensive set-up changes.

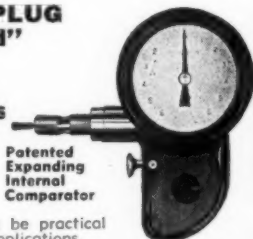
The new device is adjustable to nearly any position. It can handle precision milling, drilling, and boring at any angle, enabling a work piece to receive its necessary machining with the original set-up. The attachment will accommodate one or more cutters up to 4" in diameter; it will also take a standard $\frac{1}{2}$ " chuck for drilling, boring, and reaming at a 90° angle to the drive shaft. Precision-built, with a gear ratio of one to three, this new milling at-



tachment is easily installed. For complete details, write:

Bemis & Call Co., Dept. BB
180 Main St.
Springfield, Mass.

Here's COMTORPLUG the "Unrestricted" Internal Gage Gages precision bores to fractions of .0001". "Unrestricted" because—



Patented
Expanding
Internal
Comparator

COST is so reasonable as to be practical for all quantity gaging applications.

PORTABILITY. Available anywhere instantly. Weighs but a few ounces. No hose, wire or fixtures.

SKILL OF USER. Anyone can use it with complete precision after a few tries. Automatic centering and alignment and uniform pressure assure this—experience in many war plants proves it.

SCOPE. Measures holes $\frac{1}{8}$ " to 8" dia. and larger, to fractions of one ten-thousandth. Shows true diameter and reveals out-of-round, front or back taper, barrel shape, bell mouth. Measures extreme bottom of blind holes.

DEFINITENESS. Not a passing reading, but a fixed, definite reading, assured by automatic features independent of human errors or variations of feel or judgment.

Request Bulletin 33

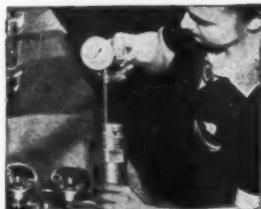
COMTOR CO.

62 RUMFORD AVENUE

WALTHAM, MASS.



MACHINE OPERATOR



INSPECTOR

Other Comtor Products:
"COMTORGAGE," Precision External
Comparator: Bulletin 30
COMTOR SURFACE SMOOTHNESS
COMPARATOR: Bulletin 32A

One of the 4 is **EXACTLY RIGHT**
for your metal cutting...

DISSTON **BAND SAWS**



Regular type for normal high speed cutting.



Reinforced type for heavy-duty, high speed cutting.



Buttress tooth pattern for speeds of 3,000 f.p.m. and over.



Regular type for normal low speed cutting.

No matter what metals you cut nor at what speeds you operate, Disston has the right band saw blade to speed up your work, reduce down time and cut costs.

HARDENED THROUGHOUT

For high speed cutting of non-ferrous metals, plastics and many other materials. Two types (Regular and reinforced). Also recommended for friction cutting of ferrous metals at speeds of not less than 12,000 f.p.m. All sizes.

HARD EDGE, FLEXIBLE BACK

Hardened on tooth edge only for greater flexibility and longer life. Two types (Regular type for general metal cutting; Buttress tooth specially recommended for magnesium and aluminum alloys). All sizes. 100 ft. coils, 1/4" to 1/2", packed in the handy Disston Safety Reel.

ANOTHER COST-CUTTING TIP

Use these Disston Metal-Cutting Tools:
FILES... HACK SAW BLADES... CIRCULAR SAWS... CARBOLOY FITTED CIRCULAR SAWS... TOOL BITS.



Order from your Disston Distributor,
or write direct for further particulars

HENRY DISSTON & SONS, INC., 1049 Tacony, Philadelphia 35, Pa., U.S.A.

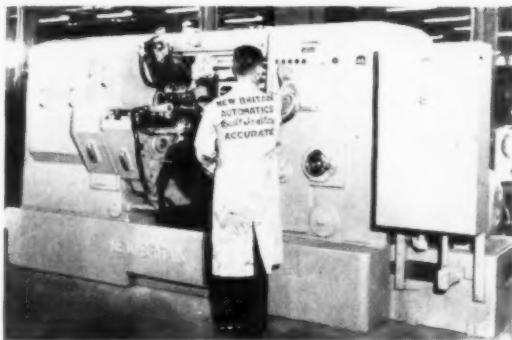
In Canada, write: 2-20 Fraser Ave., Toronto 1, Ont.

NEW BRITAIN 6-SPINDLE AUTOMATIC SCREW MACHINE

The New Britain-Gridley Division of The New Britain Machine Co. announces this new Model 602 multiple spindle automatic screw machine. Designed to be a large size companion to their new Model 601, 1 1/4" automatic, this new machine is built from the ground up to handle carbide tooling; it has a standard capacity of 2 1/4".

The six cross slides of this automatic are all radial to the center line of the spindle carrier and are 60° apart. This symmetrical radial arrangement gives the same line of forming thrust in each position and allows interchangeability of tool holders among the five heavy duty forming slides.

Carbide tooling can be applied to this machine because of its over-all weight and ruggedness. Cross slide cams are within the cross slide mountings and, being directly behind the slides, eliminate deflection common with conventional linkage. The increase in chips from high speed carbide production is taken care of by the wide open tooling area, large chip capacity in the pan, and a chip conveyor.

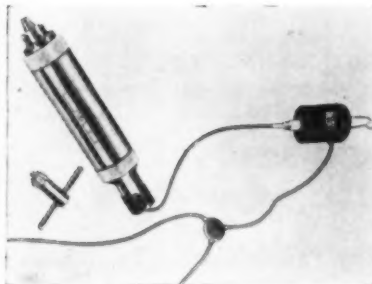


Simple, quick set-ups are accomplished, since tool holders are interchangeable, cross slide cams are easily changed, and attachments are conveniently applied. A universal main tool slide adjustment permits the selecting of any ratio of approach to feed without changing high point, drawback, stops, or total stroke. Stock feed out length is adjusted without changing any cams.

For complete details, write:

New Britain-Gridley Machine Div.
The New Britain Machine Co.,
Dept. BB, New Britain, Conn.

HANDPIECE FOR FLEXIBLE SHAFT MACHINES



The L & R Manufacturing Co. announces the availability of its new No. 17 quick detachable radial handpiece with Jacobs chuck for flexible shaft machines. The new accessory may be used with the company's own line of flexible shaft units or with those made by any other manufacturer.

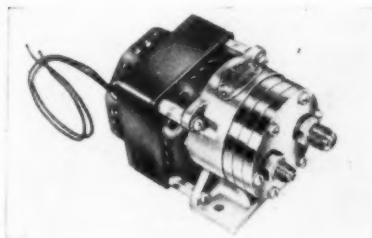
The handpiece is made of a two-piece aluminum housing with two pre-sealed ball bearings and features a No. 0 Jacobs chuck with 0 to 5/32" range. The device is made with an aluminum body that can withstand rough continual handling, blows against benches

and possible dropping and will have an indefinitely long life if used with ordinary precaution. It is cool running and may be easily attached to the flexible shafting. The handpiece measures 5¼" long by 1 1/16" in diameter. For full information regarding the new handpiece, write:

The L & R Manufacturing Co.
577 Elm St., Dept. BB
Arlington, N. J.

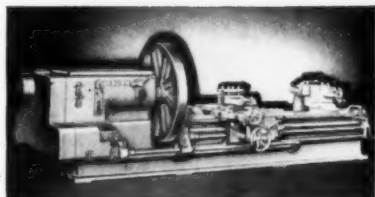
MOTOR-DRIVEN PUMP UNIT

A new Metering Pump Unit has been announced by the Mechanical Products Corp. While designed to provide precision dispensing of syrups in vending machines, it is also applicable to many other liquids. The uniformity with which this motor-driven unit discharges the liquid is not affected by a wide change in temperature or viscosity.



While the pump has a capacity of 10 c. c. per second, it is adaptable to a wide range of output. The unit is powered with a 1/35 h.p. Shaded Pole Induction Motor, 4 poles suitable for intermittent duty without fan, 115 volt, 60 cycle, single phase. The slow speed of the motor and substantial speed reducing gears insure ample power and long wearing qualities. The entire unit fits into a space 4" square by 6½" long. It weighs 7 lbs. complete. It is easily installed as an integral part of new or old equipment. For additional data, write:

Mechanical Products Corp., Dept. MT
168 N. Ogden Ave.
Chicago 7, Ill.



SLIDING BED GAP LATHES HAVE ENCLOSED QUICK CHANGE BOX AND HARDENED STEEL BED WAYS

Two heavy duty sliding bed gap lathes recently redesigned by The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio, are built with a totally enclosed, automatically lubricated quick change box, and hardened and ground steel bed ways front and rear.

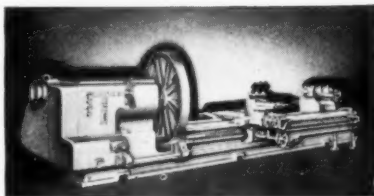
These improvements have been standard for some time on many LeBlond heavy duty engine and tool room lathes, and have been added to the 25"/50" (above) and 32"/60" (below) sliding bed gap lathes which are now said to be the most advanced of their type.

The new enclosed quick change box on both models offers two optional ranges of 48 feeds and threads. The entire mechanism is sealed in an oil-tight casting and is lubricated automatically, requiring no operator attention. It has steel gears throughout, and sliding gears are mounted on splined shafts.

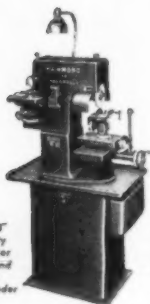
The hardened ways test at 66 Rockwell C, retain lubricant and thereby reduce friction and wear, and are replaceable in the event of accidental damage. The front way is fitted to conform to the LeBlond compensating vee-way principle.

The LeBlond sliding bed gap lathe line includes a smaller model—16"/38"—which will in the future be equipped with hardened ways.

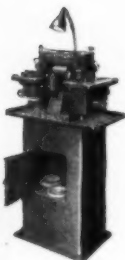
For additional information on the LeBlond sliding bed gap lathes, write today for your copy of SBG-101. Address The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.



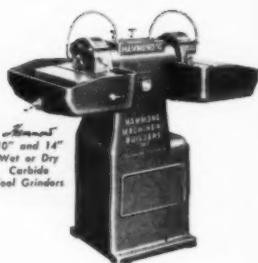
Hammond
Heavy Duty
Chip Breaker
and Diamond
Finishing
Carbide Grinder



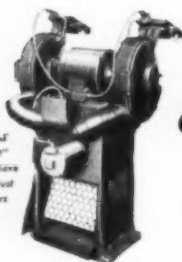
Hammond
7" Roughing
and Finishing
Carbide
Tool Grinder



Hammond
10" and 14"
Wet or Dry
Carbide
Tool Grinders



Hammond
"No-Dust"
Grinders have
built-in Dust
Collectors



Hammond

**CARBIDE TOOL GRINDERS •
POLISHING LATHES • AUTOMATIC
and CYLINDRICAL FINISHING •**

Hammond
Variable Speed
Polishing Lathes,
1500 to 3000
RPM instantly

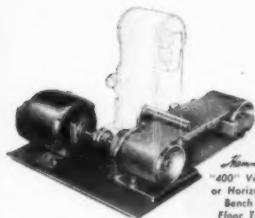


Hammond
Rotary Automatics for hi-production
Polishing, Buffing and Deburring.



Hammond
"OO" Cylindrical Finishing with wheels or abrasive belts
— handles tubes, rods, bars and other Cylindrical shapes.

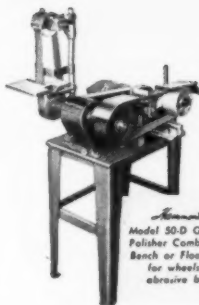




Hammond
"400" Vertical
or Horizontal,
Bench or
Floor Type.



Hammond
VH-2 Flexible
Belt Grinder
Bench or
Floor Type

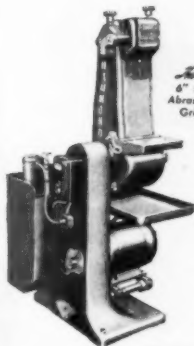


Hammond
Model 50-D Grinder-
Polisher Combination
Bench or Floor Type
for wheels or
abrasive belts

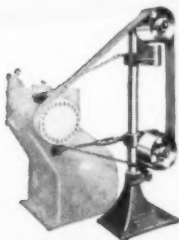
of KALAMAZOO

ABRASIVE BELT GRINDERS-POLISHERS and BACKSTANDS

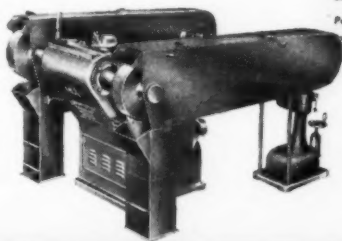
Prominent in the complete line of Hammond Grinding and Polishing Equipment is our Abrasive Belt Line of Grinders, Polishers, Grinder-Polisher Combinations, Flexible-belt and Backstand Units. This relatively new development — the use of abrasive belt machines — has had for its testing-ground the high production demands placed upon it throughout the war years. For faster, better grinding, polishing and deburring round, flat and irregular shaped parts in metal, plastics, wood, ceramics and other materials.



Hammond
6" to 10"
Abrasive Belt
Grinders



Hammond
No. 4
BACKSTAND
for use with
abrasive belts



Hammond
No. 3
BACKSTAND
and Variable
Speed
Polisher Unit

Hammond Machinery Builders INC.

1614 DOUGLAS AVENUE • KALAMAZOO 54, MICHIGAN

POST ELECTRONIC COUNTERS FOR COMPUTING LARGE UNIT QUANTITIES

The Post Machinery Co., Division of Reid Brothers Co., Inc., has introduced an Electronic Counter specifically designed for counting folding boxes. The equipment has been tested in the Post Electronic Laboratory for over six months of continuous operation, followed by a field test of over a year prior to its release to the general trade.

The proven merits of electronic counting are becoming recognized, due to the many inherent advantages. In the Post Electronic Counter there is no mechanical contact, but instead an interruption of a beam of light by the passing carton which actuates the electronic circuit.

The count is always accurate, regardless of the speed, size, or shape of the carton. Counts in units of 25 or 50 may be obtained by the turn of a dial. Cartons can be spaced very closely while travelling through the machine, since a gap of $\frac{1}{4}$ " is sufficient to operate the electronic circuit. Double sidewall cartons can be counted, since no excessive

delivery belt pressure is required to carry the carton through the triggering mechanism.

The photo-electric pick-up head is equipped with a standard photo tube and a 6-volt bulb. The interruption of the beam of light by the passing carton



actuates the electronic circuit; after 50 or 25 cartons have interrupted the light beam, a relay contact is closed, which energizes a solenoid which displaces the counted carton from its normal line of travel. A totallizing counter can be

PRACTICAL CARBIDE CUTTERS

**LOW INITIAL COST LOW BLADE COST
GREATEST FLEXIBILITY LOW MAINTENANCE**

Howald Milling Cutters give you practical advantages in carbide milling . . . The locking devices hold square blades without serrations, grooves or other limiting elements. . . . Blades can rapidly be removed, replaced and adjusted accurately. . . . End Mills— $1\frac{1}{2}$ "—3" diameter. . . . Shell Mills—3"—6" diameter. . . . Face Mills— $8\frac{3}{8}$ "—14" diameter.

Write for Bulletin No. 23

DESIRABLE TERRITORIES AVAILABLE

W. T. HOWALD MACHINE WORKS
182 Sigourney Street Brooklyn 31, N. Y.

connected with the electronic circuit, should an accumulative count be desired.

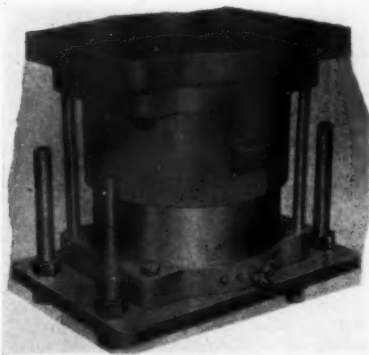
The Electronic Counter is easily adaptable to many other applications where accurate, high speed counting is desirable. It is necessary only to position the photo electric head in such a manner as to have the article that is to be counted interrupt a beam of light. For complete data, write:

Post Machinery Co., Dept. BB
145 Elliott St.
Beverly, Mass.

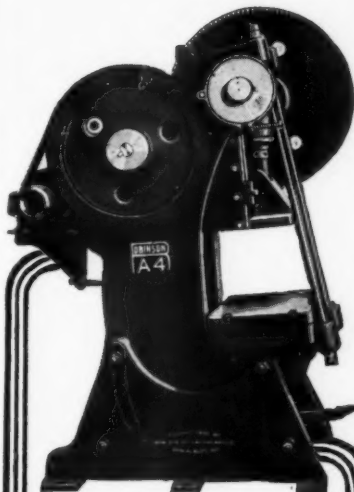
NEW PNEUMATIC DIE CUSHION

This new model die cushion installation is generally furnished where four suspension rods carry the mounting plate which supports the die cushion cylinder. This type of installation allows the user to remove the bolster plate without removing the die cushion cylinder.

The hardened and ground pin pressure pad is machine cut to fit the press bed opening, thus utilizing all of the press bed opening area. Two stop rods are furnished, thus preventing the cylinder from becoming detached from



the lower piston section in the event the air is turned on when the bolster plate is removed. The cylinder may be drained from a front pet cock provided with each installation. Greasing is ar-



The ROBINSON *Inclinable* PUNCH PRESS

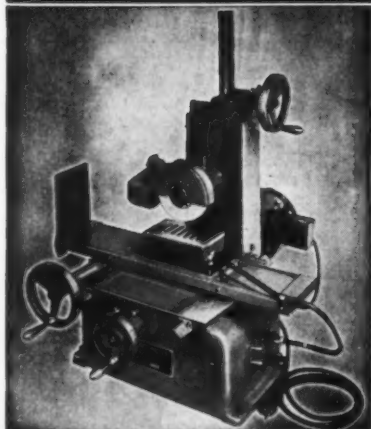
The new and improved Series A Robinson Punch Press is noted for safe, dependable operation. Sturdily built and employing finest construction features, a Robinson Series A offers years of trouble-free operation at minimum maintenance cost. Five sizes now available for immediate delivery.

New Albany Machine Mfg. Co.
NEW ALBANY, IND.

ROBINSON

Inclinable
PUNCH PRESSES

SANFORD



High-Speed BENCH SURFACE GRINDER

ACCURATE WITHIN .0001

A sensitive machine built to rigid standards of accuracy and workmanship specially designed "For the job that fits in your palm."

WRITE FOR BULLETIN

SANFORD MFG. CO.

1020-28 Commerce Ave.
Union, N. J.

ranged by special grease fittings at the front of the lower cylinder section.

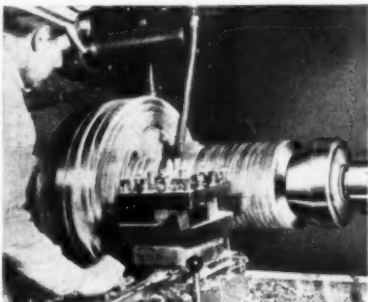
These are now furnished in ring holding pressures from $1\frac{1}{2}$ tons to 75 tons on 100-pound airline. Each cushion is provided with a combination regulator and gauge, and surge tank can be applied when maximum drawing capacity is required on the die cushion.

For specifications and performance details, write:

Dayton Rogers Mfg. Co., Dept. BB
2824 13th Ave., So.
Minneapolis 7, Minn.

LIVE CENTERS FOR TUBE TURNING

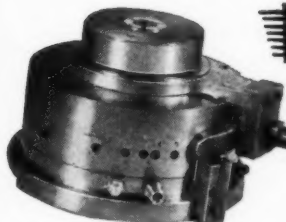
Special Live Centers adapted to tube turning are announced by the Sturdimatic Tool Co., in sizes of $1\frac{7}{8}$ ", $2\frac{3}{8}$ ", $2\frac{3}{4}$ ", and $3\frac{1}{4}$ " diameters, standard shank with Morse Tapers carried in stock. Other sizes, taper and blunt nose type, are built to specifications.



Characteristic of the design of all these tools is a low overhang and a slight cushioning action which compensates for expansion due to heat, shock and excessive thrust loads, thus reducing wear to a minimum. A large thrust bearing takes all thrust load, large radial bearing takes only radial load. For complete specifications on these useful new units, write:

Sturdimatic Tool Co., Dept. BB
5220 Third Ave.,
Detroit 2, Mich.

"Air Devices by Redmer"



RC-5



Index Chuck

with Air Operated Collet

Eliminates removing chuck from base of machine for changing index position. Index screw posts located on OUTSIDE of chuck. Provides positive alignment and depth control by using stationary type collets. Capacity 1/16" to 2".



Air Foot Control and Valve

Designed to make its operation as tireless as possible. Opening and closing of plunger of valve on foot

pedal is operated by a roller on pedal casting which relieves wear on plunger and facilitates operation. Valve is a brass casting which will take plenty of abuse and can be removed from the foot control and used as a separate unit in connection with cam operations.



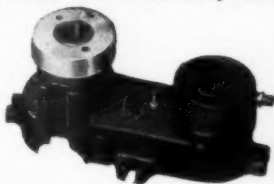
No. FC-28

V-29



Collet Air Chuck

An air operated collet holding fixture using same type collets as Brown & Sharpe automatic screw machines. For drilling, milling, threading, etc., also for assembly work. Six models, No. 00, No. 10, No. 0, No. 2, No. 2 Special, No. 4, Collet Capacity 1/16" to 3 1/2".



Write for literature and prices

REDMER AIR DEVICE CORP.

9136 West Belmont Avenue

Franklin Park, Illinois

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215

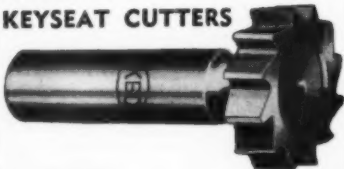


CENTER DRILLS

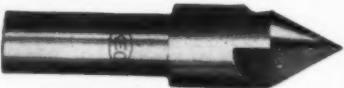


Made of finest high speed steel. Available in all standard sizes. Always in stock for immediate delivery. Specials made to your specifications.

KEYSEAT CUTTERS



High speed. Right hand. $\frac{1}{4}$ " shank. Diameters from $\frac{1}{4}$ " to $1\frac{1}{2}$ ". Standard sizes in stock for immediate delivery. Complete set—41 sizes—available in sturdy, hardwood box. Saves time and money, because you always have the size you need.



CENTER REAMERS

High speed steel. Reamers from $\frac{1}{4}$ " to $1\frac{1}{2}$ " regularly furnished with 60°, 82°, 90° included angle. Specials made to your specifications.

LATHE MANDRELS



Precision made of tool steel, hardened and accurately ground. Tapered .0005" to the inch. Mandrels from $\frac{1}{8}$ " to $1\frac{1}{2}$ " are .0005" undersize at small end, from $1\frac{1}{2}$ " to $3\frac{1}{2}$ " .001" undersize. Immediate delivery.

Write for Literature

Illustrated literature and prices on all KEO Products mailed on request.

KEO CUTTERS

19326 Woodward - Detroit 3 Mich.

NEW MACHINE MAKES LEGIBLE COPIES OF BLUE-PRINTS

A new high-speed continuous photocopy machine that makes four hundred $8\frac{1}{2}$ " x $11\frac{1}{2}$ " copies per hour, and can copy direct from originals up to 18" wide, any length, is announced by the American Photocopy Equipment Co. Developed for large offices, plants, and engineering establishments, the new machine makes it possible to have permanent, legally-accepted copies of records, blue-prints, photos, letters, invoices, and other important papers. This saves delay, steps up office efficiency, releases workers for more important tasks, and eliminates errors in copying.



Called the CP-18 Apeco Continuous Copier, the new machine copies matter that is written, printed, typed, blue-printed, or photographed. It operates on a simplified photographic principle, therefore needs no masters or stencils, or new tracings. A continuous automatic mechanism and a simplified control panel make the unit's operation easy. An original and a sheet of photocopy paper are fed together into an opening. The continuous belt and revolving glass cylinder keep them under uniform pressure, prevent slipping, and assure legible prints. The exposed sheets emerge ready for quick processing. A descriptive leaflet on the new CP-18 is available upon request to:

American Photocopy Equipment Co.
2849 No. Clark St., Dept. BB
Chicago, Ill.

NOW

is the TIME—

With industry seething with activity . . . with multi-billion appropriations speeding through Congress . . . with an all time high in employment and demand still exceeding supply . . . get ready for even higher production.



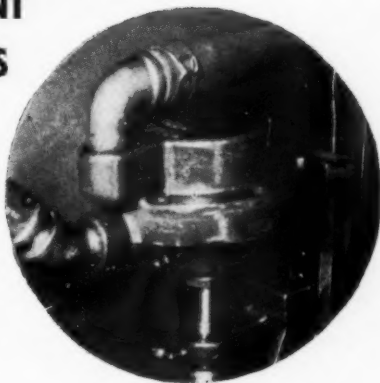
COOLANT PUMPS

Centrifugal

Cutting tools and work surfaces are held to proper workable temperatures . . . coolants hit the right spots uniformly and constantly.

FULFLO COOLANT PUMPS are available with motor, direct or belt drives.

Pipe sizes: $\frac{3}{8}$ " to $1\frac{1}{2}$ "



Precision design and precision manufacturer assure utter dependability, long life and most economical performance.

THE



Write on your letterhead for
FULFLO MECHANICAL DATA BOOK

Specialties Co., Inc.
BLANCHESTER, OHIO

FOR ADVANCED DESIGN *look into....*

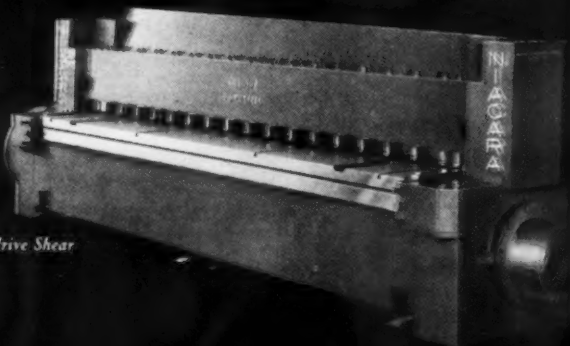
NIA



Niagara Double Crank Press



Niagara Deep Throat Press



Niagara Underdrive Shear

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N. Y.

NIAGARA

• The modern design of Niagara Presses, Shears and other machines for plate and sheet metal work is proof of the Niagara talent and experience that is built into them. Men responsible for economical production appreciate these results of Niagara engineering,— high hourly output...convenient operation...accurate work...reliable, uninterrupted performance with minimum down time...low maintenance cost.

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Niagara Double Crank Gap Press

*America's
most complete
line of*

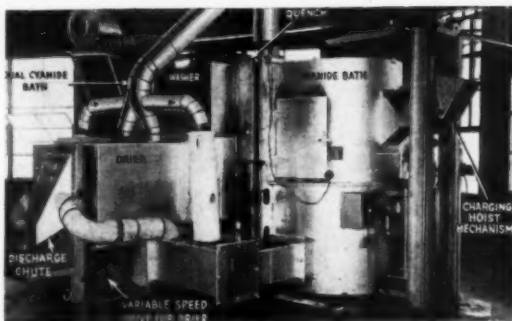
**PRESSES,
SHEARS,
TINNERS
TOOLS
AND
MACHINES
FOR
PLATE AND
SHEET METAL
WORK**

District Offices: Detroit, Cleveland, New York

DEMPSEY CONTINUOUS SALT BATH UNIT

This interesting unit, a recent development of Dempsey Industrial Furnace Corp., eliminates the undesirable phases of cyanide hardening, since all units are totally enclosed to protect the operator and create safe and comfortable working conditions. All fumes are carried off by stacks without entering the rooms. This continuous salt bath heat treating unit, for use with neutral or cyanide type salts, is suited to hardening of small parts such as screws, bolts, or similar small screw machine parts. Relatively small lots of different parts requiring varying cycles for proper hardening, can be handled speedily and economically.

The unit consists of two pot type furnaces, a quench unit, a wash unit



and a dryer. Automatic handling equipment, controlled manually, but hydraulically operated, loads the charge, which ranges from 100 to 125 lbs., into salt baths, and transfers the work through the quench, wash and dryer units, finally delivering the work into transfer

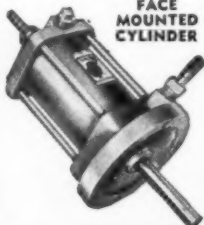
VERTICAL MOUNTING

HORIZONTAL MOUNTING

DOUBLE-ACTION AIR CYLINDERS



FACE MOUNTED CYLINDER



Mounting	Bore				
Horizontal	1 1/2"	2 1/4"	3"	4"	5"
Vertical	2 1/4"	3"	4"	5"	
Face	2 1/4"	3"	4"	5"	
Swivel	2 1/4"	3"	4"	5"	

Length of stroke optional

The new Mead Air Power Catalog shows the full line of single and double-acting cylinders, and air-operated Presses, Vises, Chucks, Hammers, Work Feeders—for faster, money-saving production. Write!



SUSPENDED OR SWIVEL MOUNTING



MEAD

SPECIALTIES COMPANY

4114 No. Knox Avenue, Dept. YA-108 Chicago 41, Ill.

Quality

AT LOW PRICES

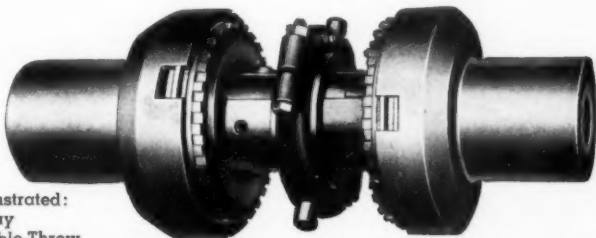
YOU'RE sure of top quality . . . a trial will prove that power is transmitted with that s-m-o-o-t-h, uniform, unvarying flow which you demand . . . and Conway's new production methods also assure you low prices.

CONWAY CLUTCHES

Standard models offer variety to suit almost every purpose. If not, special designs are available for specialized installations. 1/3 to 300 hp; 10 to 2300 rpm.

Write for bulletins.

**PRECISION-BUILT
OF BASIC MATERIALS;
STANDARDIZED,
INTERCHANGEABLE PARTS**



Illustrated:
Conway
Double-Throw
Clutch

The CONWAY CLUTCH Co.

2745 Colerain Ave.

Cincinnati 25, Ohio

box, or other receiver, without manual handling.

The salt bath temperatures and heating cycle may be varied for each batch as may be necessary for optimum results. The furnaces can be designed to use oil, gas, or electricity as fuel. The capacity of the unit is 300 to 500 lbs. per hour of finished work when cyanide hardening screws to a case depth of approximately .003". For further details and information, write:

Dempsey Industrial Furnace Corp.
133 Main St., Dept. G
Springfield, Mass.

FORM TOOL BLANKS FOR AUTOMATIC SCREW MACHINES

The Production Service Co. introduce a complete line of Circular Form Tool Blanks, to be used for circular tools on all types of automatic screw machines. These blanks are made from a standard brand 18-4-1 high speed steel, and can be furnished soft or in a hardened condition, having a 64-65 Rockwell "C" hardness.

When these blanks are used, it is unnecessary for the small tool user to carry a supply of high speed steel stock. Large users, also benefit by having the semi-processed tool blank on



hand so that the finished tool can be processed in a very short time. The manufacturer's tooling includes the furnishing of both left and right hand threaded tool blanks.

A new brochure describes completely the entire line of Production Service Tool Blanks. Write:

Production Service Co., Dept. BB
1060 Broad St.
Newark 2, N. J.

Polish! Lap! De-burr! Finish!



Write for Catalog 480

Small Metal & Plastic Parts

50% to 90% Faster!

These small, inexpensive machines **polish, lap, de-burr, or finish** small metal and plastic parts 50% to 90% faster, more accurately and uniformly—and pay for themselves in product savings and lower production costs. There is a size and type of Schauer Speed Lathe for any secondary finishing operation. Learn how Schauer Speed Lathes can increase production and lower costs in your plant.

THE SCHAUER MACHINE CO.

Originators of Today's Speed Lathes
2064 Reading Rd., Cincinnati 2, O.

PRACTICALLY INDESTRUCTIBLE!

ACME BENCH VISES have ALL these features

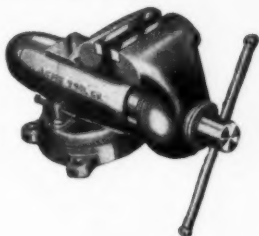
Maximum Gripping Power * Longer Vise Life

No Side Twist * Unbreakable Sleeve Nuts

Interchangeable Ground Jaws * Swivel Bases

11 Sizes from 2" to 6"

Also ACME COMBINATION PIPE AND BENCH VISES with same outstanding features have 4½" wide jaws. Holds pipe ½" to 3½".



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B-R-E-A-K

Hand Finishing Bottlenecks

with

**PORTABLE * ELECTRIC
RECIPROCATING TOOLS**

These handy tools will cut out many tedious hand filing and finishing operations—Increase Production—Produce Uniform Work.



Light in weight—Delivers ⅛" or ⅜" fixed stroke at 1000 strokes per minute—Operates on 110 volts AC or DC.

VISIT OUR BOOTH 732
METAL SHOW
Philadelphia
Oct. 25-29



**PRECISION
REDUCTION
TOOLS**

ACME TOOL COMPANY

71 W. BROADWAY NEW YORK 7, N. Y.

SAVE TIME, MONEY

**with rugged
QUEEN CITY
GRINDERS**

A battery of Lo-Cost Queen City Grinders is real production insurance. Placed conveniently throughout your plant, they'll stop wasted work-hours caused by "ganging up" around one lone grinder. Low in cost, Queen City Grinders quickly pay for themselves in production gained. Write for Catalog.

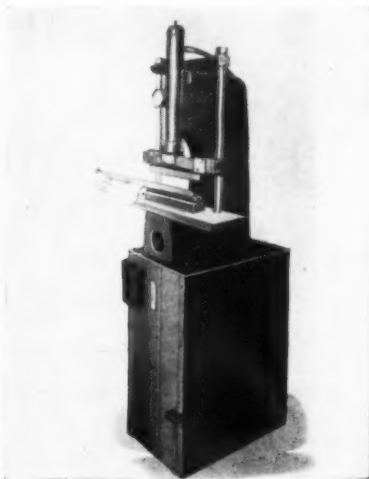


**QUEEN CITY
MACHINE TOOL CO.**

**235 E. 2nd St.
CINCINNATI 2, OHIO**

**NEW HYDRAULIC PRESS BRAKE WILL
CONVERT TO PRESS**

The Munton Manufacturing Co. has introduced a new hydraulic press brake which will handle a large variety of work. The unit is available in three sizes—10, 20, and 30-tons capacity. The brake will readily make 90° bends in mild steel. The 10-ton model will handle 18-gauge stock, 3 feet long, 14-gauge stock, 2 feet long, and 10-gauge, 1 foot long. The 20-ton unit can handle 12-gauge, 3 feet long, and the 30-ton model is capable of handling 10-gauge stock, 3 feet long.

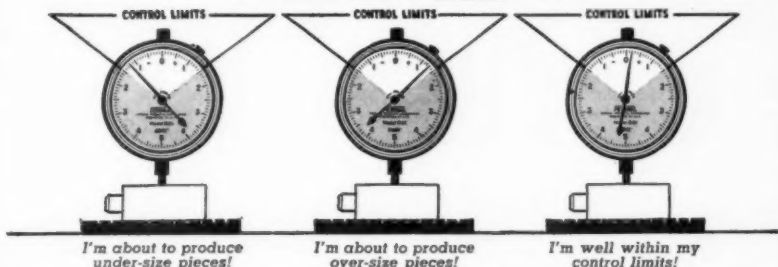


The Munton 10-ton model with spring return is shown. It is used for forming only, unless the die sets have springs to the brake punch and die. The dual cylinder model, providing pressure down and up, is recommended for punching, broaching, pressing, etc. There is a 9" throat between the guide rods which are 20" apart, and a 3" throat from the guide rods out.

The Brake can be converted to a hydraulic press by removing the cross rods, tie rods and bed. The standard equipment includes the pump, motor,

Warning!

It's time for new eyes in your production line—
to make the work come through right the first time
—to let your workers see what they're making
—to adjust machines before they produce scrap.



Dial Indicator Gages tell the mechanic what he wants to know. They show him whether the part is too large or too small; they also show him exactly how much the workpiece is off standard. He gets an accurate reading at a glance; he saves time; he no longer relies on the sense of "feel".

Furthermore, and most important, the Dial Indicator tells the operator exactly how much the work is tending toward the high or low limit. Hence, he knows how much or how far to readjust the setting of the machine.

When control limits are set up on a Dial Indicator, the machine's tendency to exceed these limits is quickly spotted; the machine is adjusted before the scrap is produced.

Dial Indicators can be applied to the gaging of any linear dimension. We make both regular and custom-built gages to meet the needs of users

in a hundred industries. For highly specialized needs, we also make Air Gages and Automatic Electronic Sorting Gages. Let us help you with any problem of gaging and inspection. If you will send us blueprints of work to be measured, we will gladly recommend the proper gage. No obligation is involved.



FEDERAL

FEDERAL PRODUCTS CORPORATION
1144 Eddy Street, Providence 1, R. I.



Represented in Canada by RUDEL MACHINERY COMPANY, LTD.

YOUR PROFIT DECISION IS *Visible** PRECISION

*The use of Dial Indicator Gages—visible precision—lowers inspection costs, raises production. Federal Products Corporation is America's largest maker of both standard and custom-built gages—mechanical, air, electronic—for the measurement of single and multiple dimensions.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

cylinder, gauge, and all necessary connections. A descriptive bulletin is available upon request. Write:

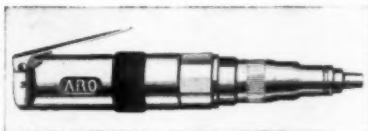
**The Munton Manufacturing Co.,
9400 W. Belmont Ave., Dept. BB
Franklin Park, Ill.**

ARO EQUIPMENT ANNOUNCES NEW LINE

An exclusive new line of low-speed, high-torque air screw drivers and nut setters, is introduced by The Aro Equipment Corp. Twelve new models (Nos. 7060 to 7071 incl.) in a range from 450 to 1100 r.p.m. include pistol type and lever type air tools with a choice of positive or friction clutch.

The introduction of slow speed screw drivers and nut setters presents several advantages. These tools provide a higher driving torque in order that larger size screws and nuts can be driven. The tools will drive $\frac{1}{4}$ " screws and bolts at higher speeds, but will handle up to $\frac{5}{16}$ " bolt size at the slow speed of 450 r.p.m. Also, better driving of wood screws is assured by the high torque developed at slow speed.

A slower driving speed saves bits. At a slower speed, the bit finds the screw slot easier and does not damage the screw's head. Attachments, particularly clutch jams, will last longer due to the slower ratcheting of the jaws.



Slow speeds of 450 to 750 r.p.m. are particularly suited to self tapping screws and cross recessed head screws. For complete specifications and sizes, write:

**The Aro Equipment Corp., Dept. BB
Bryan, Ohio.**

Manufacturers' sales for the first half of 1948 are estimated at \$103 billion, an advance of 15% over the corresponding period of 1947.

IT'S EASY TO TAKE THE GRINDER TO THE WORK



The Marschke Heavy Duty Swing Frame Grinder is easy to maneuver and gives maximum metal removal. Massively constructed for long, dependable service, this Marschke Grinder provides smooth true wheel rotation for steady contact between the wheel

and the work . . . gives minimum wheel wear. Provision is also made for adjustment of wheel surface speed to compensate for wheel wear.

Simplicity of construction, plus balance and maneuverability, contribute to efficient operation. These Marschke Grinders quickly pay for themselves and give many years of trouble-free service.

Other Marschke Grinders available include pedestal and floor stand grinders and buffers and the "In-Between" Grinder.

Write today
for complete
details

**VONNEGUT MOULDER
CORPORATION**

1805 MADISON AVENUE

INDIANAPOLIS, INDIANA

REJUVENATE YOUR BROACHES

TO ORIGINAL CONDITION
(Quick Delivery)

If you have only "round" broaches (cylindrical, splines, etc.) up to 36 in. long 72 in. long 84 in. long	You need this Sharpener RG1-36 RG1-72 RG1-84
If you have only "flat" broaches (surface broaching)	FS3-36
If you have both flat and round broaches up to 72 in. long 84 in. long	CS3-72 CS3-84
Ask for complete information by model number	

with one of these Broach Sharpeners



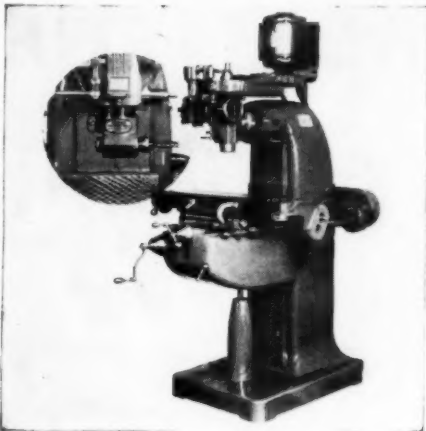
When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

NEW INDEX MILLER FEATURES INCREASED WORKING CAPACITY

The Index Machine Co. has recently introduced their Model 50 High Speed Vertical Milling Machine. This new unit is of rigid construction, without deflection or chatter to offset the accuracy of the work performed. A quick-change full-geared table feed mechanism delivers power to the table through a splined feed shaft, eliminating the key-way of the lead screw, thus increasing the machine's precision and sensitive operation.

The unit is equipped with automatic spindle and table speeds. Twelve variable cutter speeds are provided, up to 2450 r.p.m. The three table speeds may be varied indefinitely.

An outstanding feature of this new miller is its angle milling head (see illustration), which handles horizontal milling operations of every type, including boring and drilling. The compact head unit makes the



change-over from vertical to angle milling in a few seconds. The unit can also

Banded **THRUST BEARINGS**



REGULAR
OR SPECIAL
DESIGN TO 24" O.D.

We also make Thrust Bearings interchangeable with other manufacturers.

**We take in extra work on
Blanchard Grinders.**

ACORN BEARING CO.
66 Stanley Street New Britain, Conn.

*Interchangeable
type and holders
for every
marking
need*



*Ask for
Catalog
5-45*

NEW METHOD
Steel Stamps INC.

147 Jos. Campau

Detroit 7, U. S. A.

be used as a cutting arbor or tool holder. For full information, write for catalogue to:

Index Machine Co., Dept. BB
545 N. Mechanic St.
Jackson, Mich.

SCREWDRIVER WITH REVERSIBLE BLADE

A new screwdriver is announced which accommodates both the Phillips head and the regular screw by merely reversing the blade.

Ideal for automobiles, office equipment, and countless other devices, the Vaco Duplex Reversible Screwdriver becomes a real timesaver where slot screws and cross-slot screws are used in combination.

The oil-tempered, chrome vanadium-steel blade is easily and quickly inserted or removed; there is no play. It will not come apart in normal use, yet the reversing operation, positive spring action clutch in the center of the shaft, provides fool-proof chucking.

The Amberyl handle is Slo-Burning for safety, has fluted, edges, chamfered with deep flute vacuum grip, and bears the Underwriters' Laboratories re-examination service marker. It is shock and break resistant and is impervious to most alkalis and acids.



The Vaco Duplex Reversible Screwdriver is a quality tool for servicing both regular and Phillips screws, now installed everywhere. It is fully guaranteed against defects in materials or workmanship. Manufactured by:

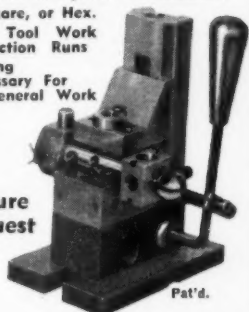
Vaco Products Co., Dept. BB
317 E. Ontario St.
Chicago 11, Ill.

WITH A McCULLOUGH PRECISION GROUND DRILL JIG

You can Drill Up to 1/2" Holes
In Materials Up to 2" Diameter

Round, Square, or Hex.
Ideal For Tool Work
Or Production Runs

No Tooling
Necessary For
General Work

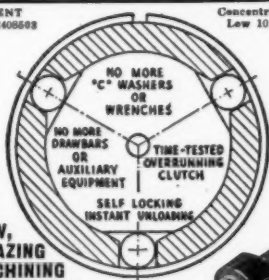


Literature
on Request

McCULLOUGH MFG. CO., DEPT. BB
448 W. Larned St., Detroit 26, Michigan

PATENT
No. 2408898

Concentricity to
Low 10,000ths



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YOUNG PRECISION EXPANDING
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Curtis-Wright Corporation ranks our product with their best tools. Cleveland Graphite Bronze Company, leading bearing manufacturer, states new high accuracy reached, plus substantial production boosts.

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YOUNG ARBOR CO. • PH. TOWER 1-3076
2140 Scranton Road Cleveland 13, Ohio

MIGHTY MIDGET RADIUS DRESSER

PUT ONE ON EVERY SURFACE GRINDER



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HARDENED SHAFT —
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DIAMOND ALWAYS
CLAMPED PERFECTLY
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We Also Mfr. The "Mighty Midget" Demagnetizer—\$9.00

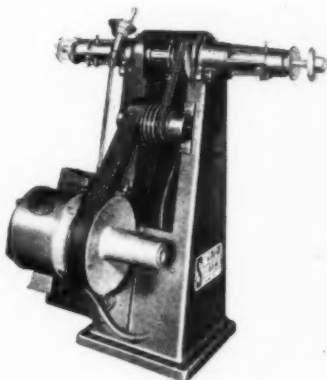
SPERMAN METAL SPECIALTIES 2199 E. 21st ST., BROOKLYN 29, N. Y.

STANDARD ADDS NEW CONSTRUCTION FEATURE, PERMITTING INFINITE LOW-SPEED RANGE

The Standard Electrical Tool Co. have added to their line of infinitely variable speed buffing and polishing machines a jack-shaft construction which permits an infinite low-speed range, or a 2-in-1 arrangement to deliver both the low-speed and the high-speed range.

The conventional infinitely variable speed buffer-polisher represents a speed range from 1500 to 3000 r.p.m. accomplished through the "Speedial" control. With the Type 3VJ2 illustrated, there is available an infinite speed range from 600 to 3600 r.p.m. The type 3VJ similar to the above is furnished only for the infinite slow speed range; this can be any 2-to-1 ratio; for example, 600 to 1200 r.p.m., 700 to 1400 r.p.m., etc.

The illustration is of the Type 3VJ2 equipped with a 3 h.p. motor enclosed spindle and four ball bearings. It is also available in 1 and 2 h.p. sizes, and optional with the two ball bearings and open spindle construction.



This slow speed range is desirable in many plastic manufacturing processes, various industrial experimental

ILLUMINATED INSPECTION



"Lenox Detects Hidden Defects" while exploring the dark holes of industry — guns, hollow shafts — Refinery, well drill and other tubing, irregular dark spaces.

LENOX INSTRUMENT COMPANY

BORESCOPIES



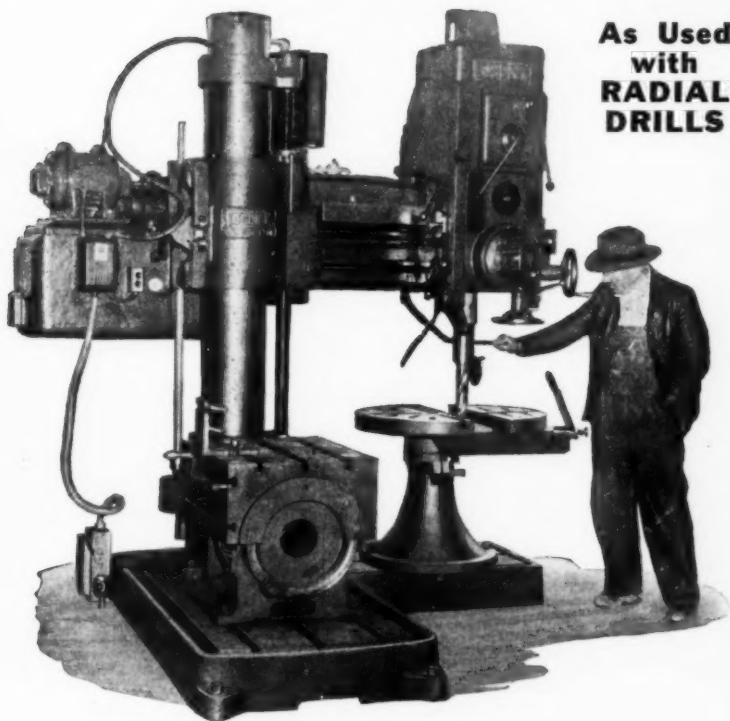
American Pioneers — Twenty-eight years. Give diameter, length and shape of cavity.

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PHILADELPHIA 3, PA.**

SAFETY DRILL TABLE

Mounted on Pedestal

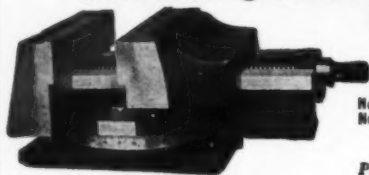
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RADIAL
DRILLS**



A time-saving tool that we will be glad to
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MODERN MACHINE TOOL CO.
Jackson, Michigan

SUPERIOR QUALITY AND WORKMANSHIP IN PLUNKET VISES



SQUARE BASE SHAPER VISE

The Shaper Vise has graduated swivel base and tongue in center to fit slot in table, and has holes for bolting down. In ordering this vise give size of slots in Shaper Table, also distance from center to center of slots.

No. 40, 10" jaws, 2 1/4" deep, opens 8 1/2". Weight 125 lbs. \$84.00

No. 4, 6" jaws, 1 1/2" deep, opens 5". Weight 45 lbs. \$62.00

Our complete line includes Vises for Drill Presses, Milling Machines, Shapers and Grinders.

Prices are net, f. o. b. Chicago. Write for illustrated folder today. Dealers inquiries solicited.

J. E. Plunket Machine Co. 1823 W. Lake St.
Chicago 12, Ill.

laboratories, etc. For complete specifications and performance data on this new development, write:

The Standard Electrical Tool Co.
2486 River Road, Dept. BB
Cincinnati 4, Ohio

NEW SERIES OF DURANT PRODUCTIMETERS

The Durant Manufacturing Co. announces the addition of new "Y" Reset Stroke and Rotary Counters to their line of Productimeter Counting and Measuring Machines.

The "Y" series comprises several compact models which require a minimum of driving effort. They are accurate and durable, designed for incorporating as an integral part of business machines, laboratory equipment, textile machines, and metal working production machines of all types.

Both the Stroke and Rotary models are available in reset and non-reset styles, in 3, 4, 5, and 6 figures capacity. The length of the case ranges between 1-1/16" and 2 1/4", depending

on the number of figures; the width is .0960" and the height 1.238".

The figures on "Y" counters are black on white background, .166" high x .097" wide. They are clear, legible baked on the metal surface. Bearings are oilless automotive type. Stroke style counters have a patented ratchet, non-slip pawl drive mechanism, while the Rotary style has a sleeve clutch mechanism that assures positive drive



and easy resetting. Original equipment manufacturers will find them of particular value for built-in application.

Durant Manufacturing Co., Dept. BB
1928 N. Buffum St.
Milwaukee 1, Wis.

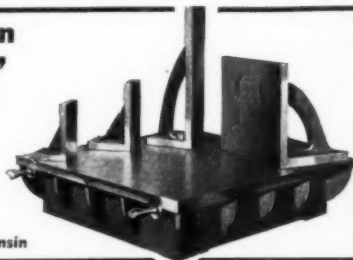
For Dependable Design Try "MILWAUKEE"

Years of research and experience have resulted in present-day Milwaukee Surface Plates, Angles, and Parallels. Sturdy construction combined with flexibility and ease of handling have made these tools outstanding among precision instruments. WRITE FOR YOUR FREE CATALOG TODAY!

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"Wanta make something out of it ?"...

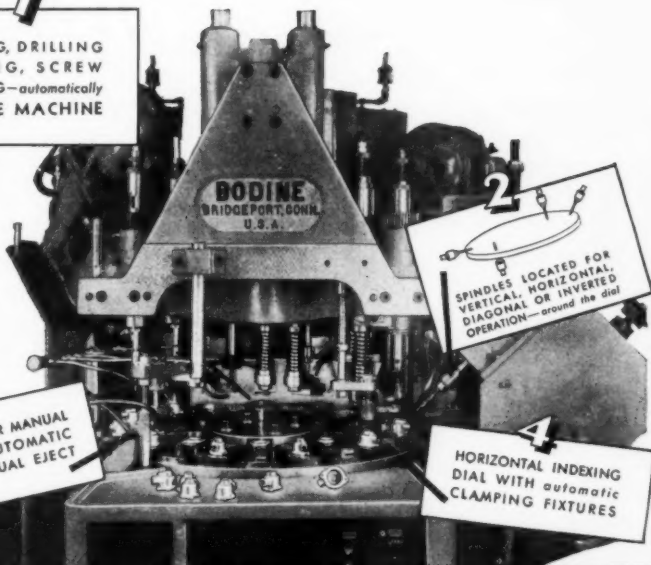
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YOU
CAN
HAVE

1
MILLING, DRILLING
TAPPING, SCREW
INSERTING—automatically
IN ONE MACHINE



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HOPPER OR MANUAL
FEED—AUTOMATIC
OR MANUAL EJECT

2
SPINDLES LOCATED FOR
VERTICAL, HORIZONTAL,
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OPERATION—around the dial

4
HORIZONTAL INDEXING
DIAL WITH automatic
CLAMPING FIXTURES

If you require repetitive production of small parts check with BODINE ENGINEERS. Six sizes, tooled to your specific job... for high speed, low cost processing.

"You can't meet tomorrow's competition with yesterday's machine tools."

SEND FOR BULLETIN BB

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AUTOMATIC DIAL TYPE DRILLING, MILLING,
TAPPING AND SCREW INSERTING MACHINES

Drilling Holes in Concrete



or Cutting out old putty
from around windows.



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DEPENDABLE

ELECTRIC HAMMERS

Will SAVE You Money
every hour they're used

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SYNTRON CO. 300 Lexington
Homer City, Pa.

PNEU-SPIN RIVETER—WITH AIR MOTOR

A pneumatic Riveting Machine, combining hammer action with rotation supplied by an air motor, which operates off both line pressure and exhaust air from the four interchangeable capacity heads, has been developed by the Schlack Manufacturing Co.

An air motor is supplied to provide the spinning action to the interchangeable capacity head Pneu-Spin Riveter, making the unit fully pneumatic. This motor consumes 6 c. f. m. at 25 p.s.i. when operating off line pressure and also can be operated off the exhaust of the air hammer in the head on work under the head's capacity.

Interchangeable heads having capacities of 3/32", 5/32", 1/4", and 5/16", based on mild steel rivets, produce 4000 to 10,000 short stroke blows per minute. Air consumption of heads is from 5 to 9 c.f.m. at 80 p.s.i. and air pressure required is from 30 to 80 p.s.i.



Peening tools mounted on taper of spindle can be supplied to form round, oval and flat heads. Eyelets and tubular rivets can also be riveted.

The unit assembles metals, wood, rubber, fibre, porcelain, and plastics. Model PS, pedestal type (illustrated)

R-B INTERCHANGEABLE PUNCHES and DIES

Proved
BY YEARS
OF USE



in DIE-BUILDING . . . in PRESS OPERATION

Die-makers and press operators everywhere understand the application and use of R-B Interchangeable Punches and Dies—because, for years, these products have been “standard” in the metal-working and plastics industries. As a result, man-hours and money are saved in die-building . . . and press operators have learned how to install and remove them quickly and easily in the press, reducing press “down-time” to a minimum. Used exclusively in many plants, they provide a sure solution to simplified inventories of punches and dies.

R-B punches and dies of standard sizes,

shapes and materials are carried in stock for immediate delivery. Special punches and dies are made promptly to your specifications.

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- ✓ Simple in design and construction.
- ✓ Unlike most parts used in die construction, R-B products have a salvage value.
- ✓ Securely locked both vertically and radially yet instantly removable.
- ✓ Selected steels with hardness controlled and finished to very close tolerances insure uniformity.
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Story*

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ALLIED PRODUCTS CORPORATION

Department 24 • 4644 Lawton Ave. • Detroit 8, Michigan

has a throat depth of $4\frac{1}{4}$ ". The frame travel is 2"; anvil height is 40". Overall height is 65". A bench type (Model PSB) is also available. Bulletin 48 gives complete information.

Schlack Manufacturing Co., Dept. BB
13255 Birwood Ave.
Detroit 4, Mich.

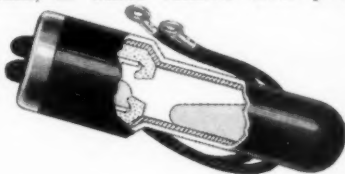
DURAKOOL METAL-CASED MERCURY SWITCHES

A new technical development in the manufacture of Durakool mercury switches consists of an electric weld which seals hydrogen gas under pressure in the metal case. The closure keeps the pressure intact whether the switch is in use or inactive on a machine or in stock. There is no perceptible deterioration over periods of many months.

The purpose of the hydrogen gas under pressure is to eliminate the usual arc between the mercury and the contact points of the switch. By killing this arc, corrosion of the electrode is virtually eliminated. The metal case of

the Durakool acts as a single electrode. In the "Double Flow" model, make and break contacts are between two mercury pools, further reducing any possibility of corrosion.

The manufacturer states that the new Durakool models are especially efficient in high capacity, highly inductive circuits, or where variable loads place



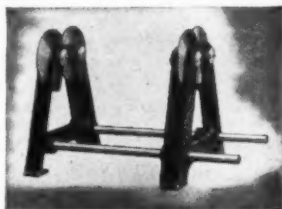
undue strain on ordinary switches. Models range from 1 to 65 amperes in capacity, and are made with or without plastic case as standard equipment. Rubber insulations may be had on order. Further information and catalog may be obtained upon request.

Durakool, Inc., Dept. BB
Elkhart, Ind.

If you handle Rotating Parts

If your shop handles rotating parts these sturdy and dependable balancing ways would be highly profitable equipment to use. In accurate balancing and truing operations they save time, labor and money. No leveling required.

Four chilled iron discs rotate with minimum friction on sensitive special bearings, giving a quick, accurate indication of whether or not the work is in perfect balance.



ANDERSON BALANCING WAYS

Swing	Distance Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000



Write for Bulletin No. 10-5

ANDERSON BROS. MFG. CO., Rockford, Ill.

Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.

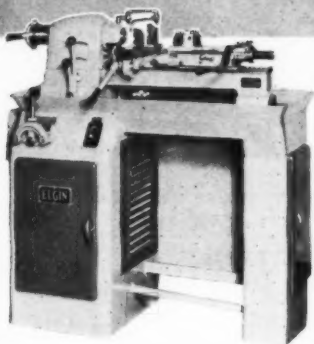


ON SMALL DIAMETER PRECISION PARTS

Elgin

WILL MACHINE THEM

Faster: More Accurately



**Elgin Knee Hole Type Hand
Screw Machine**

Variable speed range, 120 to 3800 rpm.
9" swing. 1" collet capacity. Collet rack
inside of motor compartment door. In-
dependent coolant system (5 gal.) mounted
in rear, outside—cleaner, more accessible.

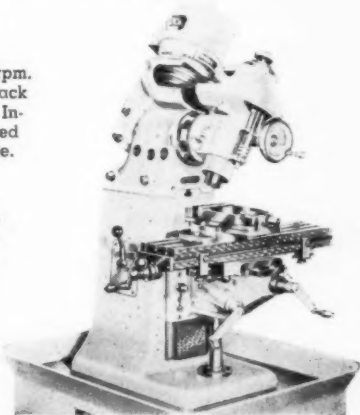
Elgin Vertical Bench Drilling Machine

Preloaded ball bearing spindle. 9/16" col-
let capacity. Five speeds ranging from 400
to 4000 rpm. Vertical travel of spindle,
1 3/4". Table 4 1/2"x18". 90° swivel each
side of center line.

ELGIN TOOL WORKS

1772 Berteau Ave., Chicago 13, Ill.

If your production problems de-
pend on the speed with which
small parts are machined, an
ELGIN may be your answer. The
line of ELGIN High Speed Preci-
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pay you dividends in better ma-
chining results, faster production
and greater versatility. Write for
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441 STANDARD SIZES
WORLD'S LARGEST RANGE OF SIZES

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LISLE, ILLINOIS

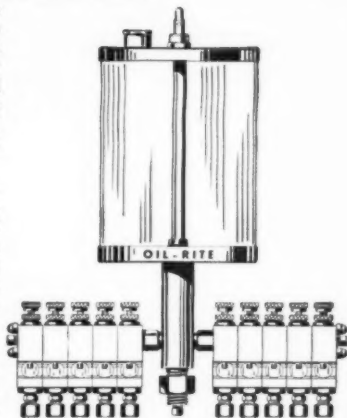
WRITE BOX 58-B

MULTIPLE SIGHT GRAVITY FEED OILERS

The Oil-Rite Corporation's new Multiple Oilers offer steady gravity feed oiling to multiple points in an attractive, compact unit. Oil is fed by gravity from a reservoir through multiple gang-mounted sight feed valves to a number of individual bearings requiring lubrication. One single oiler of this type replaces from 2 to 24 individual oilers.

Many advantages are offered by this central method of lubrication. There is only one reservoir to fill, and one shut-off lever to operate; oil which is fed to each bearing can be conveniently adjusted and observed at one station. The oilers are applicable for machine tools, punch presses, conveyors, chain lubrication, etc.

The shut-off lever on top of the oiler controls a needle valve which releases the oil to the sight feed valves. The drop feed control of each sight feed valve allows independent regulation from full flow to a complete shut-off. Hairline adjustments can be made through the use of a friction screw. The degree of friction can be varied by tightening or loosening



the knurled lock-nut. The screw can be locked against severe vibration.

Oilers are very light in weight, due to their aluminum alloy body. The con-



**"TAILOR" THE SPEED TO FIT THE JOB
WITH THE TAYLOR MADE
VARIABLE SPEED DRILLING MACHINE**

- The exact speed required for drill diameter and material at the turn of a knob.
- Exact control of speeds means less breakage, fewer grinds, higher efficiency.

TWO MODELS — 1-6 spindles

M-125 $\frac{3}{8}$ Cap. (illustrated)

M-96 $\frac{7}{8}$ Cap.

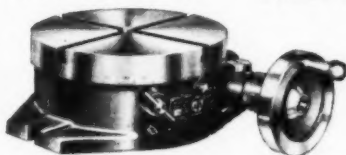
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SCRIBING BOTH MACHINES**



THE TAYLOR & FENN CO. HARTFORD 1, CONN.

**BRAND NEW
PRECISION**

ROTARY TABLES



9"	rotary table	\$ 97.00
12"	" "	175.00
15"	" "	195.00
18"	" "	235.00
18"	" "	365.00
21"	" extra heavy duty	510.00
25"	" extra heavy duty	600.00
	extra heavy duty	

OUR ROTARY TABLE WILL TAKE THE PLACE OF A COSTLY FIXTURE. IT IS USED FOR ALL KINDS OF WORK ON MILLING MACHINES, SHAPERS, DRILL PRESSES AND HORIZONTAL BORING MILLS.

IN STOCK
Special Thread Taps
& Dies, Left Hand
Taps & Dies, Plug &
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Catalog**

LAFAYETTE TOOL & SUPPLY CO.
128 LAFAYETTE STREET NEW YORK 13, N. Y.

struction consists of a reservoir, a central mounting shank, and a gang of sight feed valves. The reservoir, usually of Lucite, is supported by top and bottom caps between cork gaskets. For applications where the temperature exceeds 150° F., glass reservoirs and sights are available. The gang arrangement of sight feed valves are located on either side of the shank. Their compactness results in a small overall length which is advantageous when a large number of feeds must fit into a limited space.

Standard models are available in five body sizes, with capacities ranging from 9 ounces up to 1 gallon, and up to 24 feeds. Complete details for applications will be furnished by:

The Oil-Rite Corp., Dept. BB
3474 So. 13th St.
Milwaukee 7, Wis.

RAYMAC SOLID CARBIDE END MILLS
Manufacture of single and double end mills made of solid carbide is an-

nounced by Raymac Mfg. Company, Inc. Advantages include the fact that solid carbide end mills can be operated at twice normal speeds, resulting in increased production; they wear longer than steel mills, saving set-up time; because of the stiffness of the solid carbide shank, the tools will not mill



tapered slots. An additional advantage asserted is that the solid carbide end mills will hold to size, resulting in re-grinding economy.

Raymac end mills are machine ground for uniformity, are manufactured in straight shanks only. Immediate delivery from stock can be made on both single and double end sizes

WHERE TIME IS MONEY USE

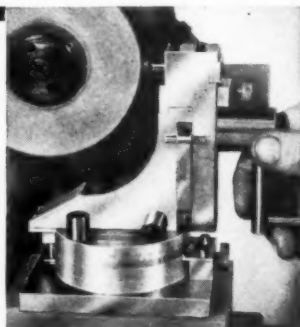
Fluidmotion WHEEL DRESSERS

Quick set-up and operation, with remarkable accuracy, make Fluidmotion Radii and Angle Dressers the finest precision instruments of their type obtainable. Two angles and a radius can be dressed in one continuous motion, after only one setting. Angles and radii flow into each other, without sharp change of direction.



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*Reg. U.S. Pat. Off.



J & S TOOL CO., INC.
471 Main Street, East Orange, N. J.
Representatives in Principal Cities

J and S Form Grinding Services: Counterbores, Circular Form Tools, Hollow Mills, Gun Drills, Flat Drills, End Cutters, Boring Tools, Step Drills, Watch Drills, Etc.

from 1/16" cutter diameter to 9/16". Shank tolerances are from plus .000 to minus .001; cutter head from plus .001 to minus .001. Special sizes and tolerances are available on quotation. Address:

Raymac Manufacturing Co., Dept. BB
3729-13 Cass Street
Detroit 1, Mich.

TITEFLEX HYDRAULIC FLOW VALVE

A new lubricator valve that delivers a positive metered amount of oil or grease to each bearing in lubricating systems is announced by Titeflex, Inc. Known as the Grannan Lubricator, it dispenses all lubricants from light oil to heavy greases without alteration. It is a fully hydraulic through flow valve, with no crevices to retard lubrication. The valve is completely inclosed to prevent leakage and to eliminate possibility of contamination to the lubricant.

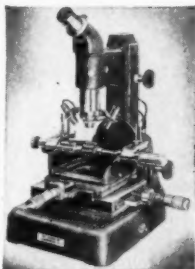


Applications include automotive and mining equipment, machine tools, and other production equipment. It will lubricate up to 500 bearings or more in less than one minute while the machine is in operation, eliminating down time for lubrication and minimizing maintenance costs. For complete details, write:

Titeflex, Inc., Dept. BB
706 Frelinghuysen Ave.
Newark 5, N. J.

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Low-priced toolmakers microscope



The WILDER

Here is at last—a precision checking tool that every shop needs, at a price that any shop can afford. Measures two ways with micrometer to .0005", or with gage blocks for closer accuracy. The image is on a clear glass reticle for maximum definition. Has understage lighting for shadow image, and surface lighting for reflected image. An essential instrument in today's precision demands, at a most interesting price. Write.

image. An essential instrument in today's precision demands, at a most interesting price. Write.

A real snap gage service —

ATLANTIC

(adjustable limit)

SNAP GAGES



Made in strict accordance with American Gage Design Committee specifications. Frames of Meehanite. Wide range of sizes, from .95 to 11 1/2". With round or square gaging pins, solid anvil, extended anvil, etc. The last word in snap gages, and at

most interesting prices. Write us for details—and also about the Scherr special service for truing and setting worn gages.

Speed inspection with the SCHERR TOOL STAND

Cuts inspection time almost in half by freeing both hands of operator, and holding micrometer or snap gage in most convenient position. Also prevents body heat affecting tool readings. One of those small, inexpensive items worth many times its cost in saved time. Try a few—then order a quantity. Price, \$7.50.



Write for full details on these tools, and for the Scherr Small Tool Catalog.

GEO. SCHERR CO., Inc.

198 - Lafayette St. New York 12, N. Y.

HANNA 4-WAY SOLENOID VALVE

A new 4-way Solenoid Valve has been announced by Hanna Engineering Corp. The small, compact unit is of the balanced spool type, controlled by a built-in solenoid pilot valve. A manifold design permits flexibility in piping arrangement; the lines may be connected to bottom, sides or a combination of both, as desired. Three-point mounting pads are provided to prevent distortion of parts.

The Hanna Valve is adaptable to straight line piping, with valve capacity equal to rated pipe size. Valves and manifolds are interchangeable and the valve proper may be removed from manifold without disconnecting pipe lines.

Solenoids may be removed and replaced without severing the wiring connections if a cord with pin plugs is used. The spool and sleeve assembly also may be replaced by removing the end caps.

Other features of the Hanna Solenoid Valve include a 5/32" solenoid stroke, silent mechanical operation and low



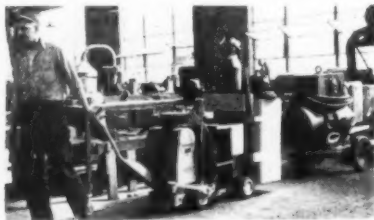
current consumption. The time required for pushbutton response or each stroke of valve spool is 1/20 second. For information, write:

Hanna Engineering Corp., Dept. BB
1765 N. Elston Ave.
Chicago, Ill.

ELECTRIC TRANSPORTER CARRIES WELDING EQUIPMENT

A battery powered motorized hand truck—the "Transwelder"—which is used to carry welding equipment from one part of a factory to another at high efficiency with minimum effort, has been developed by the Automatic Transportation Co.

The unit is an adaptation of Automatic's Transporter electric hand truck. The Transwelder was designed to solve the materials handling problem of shifting welding equipment to the various locations in a factory where welding is required.



The Transwelder consists of a Transporter chassis, equipped with a rack

in which are mounted all tanks, rods, tools, and essential equipment for acetylene welding. Space is provided for a fire extinguisher. In addition, the unit pulls the electric welder. For complete specifications, write:

Automatic Transportation Co.,
149 West 87th St., Dept. BB
Chicago, Ill.

RESINALL METALITE GRINDING BELTS

Resinall Metalite, a new heat-resistant dry grinding belt, has just been released by Behr-Manning after extensive factory and field tests showing substantial production increases over the regular glue-bond material for high heat-generating operations. Utilizing special heat-resistant, thermo-setting resin adhesives, the new Resinall Metalite Cloth belts are claimed to remain sharper, longer. Higher production both in number of pieces per man-hour and in number of pieces per belt have been demonstrated on heat-generating operations. Literature and free job tests of the new product are available by writing:

Behr-Manning, Dept. BB
Troy, N. Y.

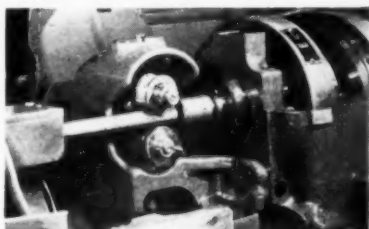
CARBIDE FEED ROLLS ON AUTOMATIC SCREW MACHINE ELIMINATE GRINDING

Solid carbide feed rolls in a B & S automatic screw machine in use at Carboloy Company, Inc., are lasting more than ten times as long between reconditioning grinds as did the steel rolls formerly used.

Two types of solid carbide rolls are used as part of the automatic feed on the No. 2G B & S automatic. The V-type roll is 2½" in diameter and 1½" wide. The steel hub in the V-type roll has a tapped hole for set screw, and also a keyway for driving. The flat type carbide rolls are in two sizes—2¾" in diameter by ¾" wide, and 2½" in diameter by ¾" wide. These handle the bar stock which range from 5/32" to 1" diameter.

The pressure feeding arrangement is shown in the photograph. Steel rolls had to be reconditioned after an average of 4,700 linear feet of steel stock had been run. Minimum time for reconditioning and setting up the steel rolls was one hour. The solid carbide rolls had not been reconditioned and showed

no appreciable signs of wear after a total of 50,300 linear feet of steel rod had been run through them in a year's time.



In addition to having saved more than ten hours of grinding and resetting time, the carbide rolls have given trouble-free operation inasmuch as the spoilage due to worn rolls has been eliminated. For additional details, write:

Carboloy Company, Dept. BB
11139 E. 8-Mile Ave.
Detroit 32, Mich.



You Need Only 1 DORMAN TAPPER

AUTOMATIC REVERSE

... instead of 3 ordinary tappers to tap
No. 2-56 to ½" in steel!

Plus Additional Advantages

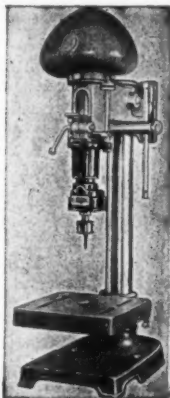
1. No Collets to get lost or need replacement.
2. Floating Chuck Jaw and Adjustable Friction Drive to prevent tap breakage.
3. No Pressure required to operate, makes a perfect thread (class 4 fit) possible.
4. Compact, Light Weight Aluminum Housing, occupies absolute minimum for tap capacity.
5. Furnished with Quill Clamp for rigidity or M. Taper Shank for quick change.
6. Low Price—No. 1 Size M.T.S. \$44.00.

3 LARGER SIZES — POSITIVE DRIVE

2-A Cap. ¾" to 7/8" in Steel. 3-A Cap. 1½" to 1¾" in Steel.
4-A Cap. 1¾" to 2" in Steel incl. pipe taps

ALL UNITS EFFICIENT AS PRODUCTION THREADERS USING
ROUND SPLIT • BUTTON • ACORN DIES

Write for Bulletin



DORMAN MACHINE TOOL WORKS 40 S. Mac Questen Parkway, Mount Vernon, N. Y.

HEAVY-DUTY BUFFER AND POLISHER OF IMPROVED DESIGN

The improved Model 110 double-spindle, heavy-duty Buffer and Polisher has been introduced by The United States Electrical Tool Co. Features are two simple levers at the top of the unit which operate the new "Push to Start and Pull to Stop" switches which the machine features. The combination switch and brake automatically stops the wheel spindle when the switch is in "stop" position. Action is instantaneous.

Two chrome-manganese steel spindles are mounted on heavy-duty ball bearings, and are protected by dust-proof housings. They are driven individually by separate motors in the base, which are mounted on individual adjustable platforms to allow for belt tension adjustment. Individual push buttons allow for the operation of either



of the spindles or both spindles at once. The back of the machine is made of heavy gauge sheet metal, and is removable to allow for full accessibility. Full details and catalogs may be obtained by writing:

The United States Electrical Tool Co.
Dept. BB
Cincinnati 14, Ohio

MOLYKOTE, AN EXTREME PRESSURE LUBRICANT

Molykote, a new dry lubricant, consists essentially of molybdenum disulfide powder; it has the appearance of graphite, though it contains none. With light rubbing it adheres to even the smoothest surfaces. Tests have shown

its extremely low friction coefficient and a phenomenal capacity to prevent galling, seizing, or metal-to-metal contact at bearing pressures well over 100,000 p.s.i., and at either high or low sliding velocities. Ten ounces will cover



Model 1400-E Pivot Mount

These air cylinders are made to your order with any length stroke you request in any of these bore sizes:

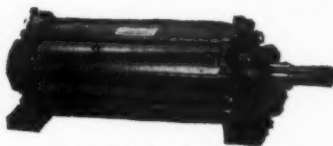
1½, 2, 2½, 3, 4, 5, 6, 8, 10

In ordering please write mounting, bore, stroke and piston rod thread you want.



Series "E"
Model 1300
Rear Flange
Mount

1 WEEK DELIVERY ON THESE STANDARD CYLINDERS



Series "E" Model 1500
Foot Mount



Series "E" Model 1200 Front
Flange Mount

PNEUMATICS INCORPORATED
OF PLYMOUTH INDIANA

NIAGARA Aero Cooling Pays for Itself!

Saves Cooling Water, Increases Capacity, Saves Operating Costs

NIAGARA Aero HEAT EXCHANGER

Cools fluids to within 10° of atmospheric wet bulb temperature; holds to tolerances of 2°F.

Heat treaters increase production, improve quality, decrease rejections by controlling quenching bath temperatures with NIAGARA Aero Heat Exchanger.

Also used in liquid cooling in industrial and chemical processes, water jacket cooling, hydraulic fluid, transformer oil, lubricating and cutting oil cooling, vapor and steam condensing.

NIAGARA Aero AFTER-COOLER

Furnishes drier compressed air . . . eliminates half the moisture allowed by conventional after-cooling methods. Protects your air tools.

NIAGARA BLOWER COMPANY

*Over 30 Years of Service in
Industrial Air Engineering*

Dept. MT-108 405 Lexington Ave., New York 17, N. Y.

Field Engineering Offices in Principal Cities

RUGGED

Gosh, Yes!

ASSOCIATED AIRCRAFT TOOL & MFG. CO., Hamilton, O., found that U. S. Drill Head's standard adjustable multiple spindle drill heads stood the gaff—and are still going strong after drilling 600,000 holes.

IMMEDIATE DELIVERY!

● **Write Today**

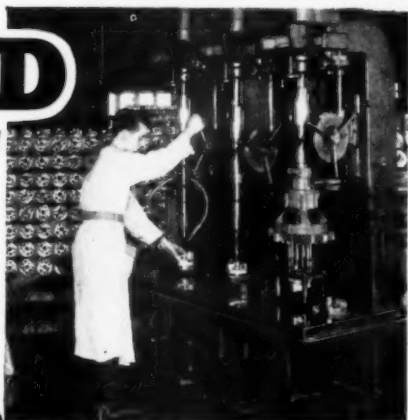
for latest catalog.



SINCE 1915

UNITED STATES DRILL HEAD CO.

CINCINNATI 4, OHIO



Also manufacturers of all types of fixed center heads

500 sq. ft. of smooth metal surface with a tenacious, shiny coating. This tenacity suggests its use as a factory-applied lifetime lubricant for mechanical articles. It is suitable for high, low, and room temperatures. When used on screw fasteners or press fits, assembly takes place at a smoothly increasing torque or force without jerking, indicating theoretically perfect lubrication. For details write:

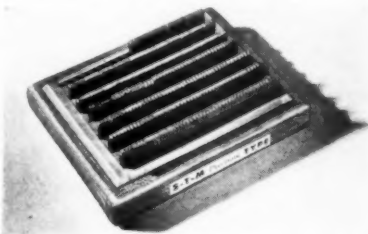
The Alpha Corp., Dept. BB
1 Seneca Place
Greenwich, Conn.

NEW CUNNINGHAM STAMPING TYPE

A new line of interchangeable steel type, identified as S-T-M Precision Type, designed for stamping brass, aluminum, copper, steel, leather, or hard rubber finished products, has been announced by the M.E. Cunningham Co. The type is available in condensed, medium, and extended Gothic characters, in sizes ranging from 1/32" to 1/2", in light, medium or bold face styles. The same range of character sizes,

widths and type faces are furnished in reverse style for stamping rubber, bakelite, or plastic molds.

The Cunningham S-T-M Precision Type will give deep, clear-cut marks whether the characters are stamped directly into the product, or from the mold to produce a raised letter. Full



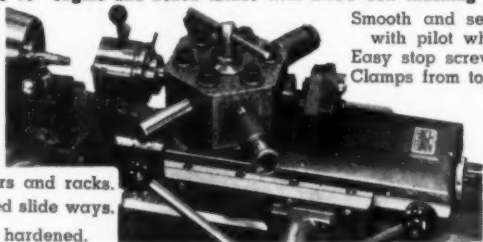
font sets and assorted quantities are also available. Complete information can be obtained from:

M. E. Cunningham Co., Dept. BB
228 E. Carson St.
Pittsburgh, Pa.

DO TURRET LATHE JOBS

on your 9" to 16" engine and bench lathes with ENCO Self Indexing Hexturrets.

Typical
Hexturret
Job.
Note die-
head and
box tool.



Smooth and sensitive control
with pilot wheel adjustment.
Easy stop screw adjustment.
Clamps from top of Ways.

Write for
catalogue
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giving make
of lathe
and size.

Double gibs.

Double drive gears and racks.

Ground and spotted slide ways.

All working parts hardened.

Model 425
1" tool holes
4 1/4" stroke
Price \$275.00

Model 425 available for Atlas, Logan, Clausing, South Bend 9" and 10", Sheldon 10", 11" and 12", Craftsman 12", Powr Kraft 10" and Sebastian 12".

Delivery 2 weeks.

Model 651
1" tool holes
6 1/2" stroke
Price \$350.00

Model 651 for all above lathes except South Bend 9".

Delivery 2 weeks.

Model 650
1 1/4" tool holes
6 1/2" stroke
\$400.00 to \$500.00

Model 650 for South Bend 13", 14 1/2" and 16", Regal 13", 15" and 17" and Sebastian 14" and 16".

Delivery 2 to 6 weeks.

ENCO MANUFACTURING COMPANY
Dept. 2108 4522-24 W. Fullerton Ave., Chicago 39, Ill.

Also Mfrs. of Enco Turret
Tool Posts For All Lathes

DRILL JIG



Bushings - Gages



ECONOMICAL - ACCURATE

IN STOCK, ready for immediate delivery, all A. S. A. STANDARD types and sizes. Exceptionally fast delivery of NEW GAGES and Gages salvaged by HARD CHROMIUM PLATING.

*Bulletin and Price Lists
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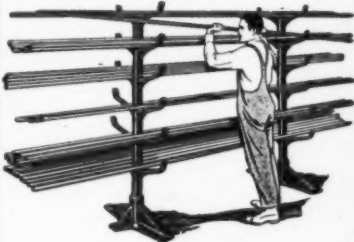
Economy

TOOL & MACHINE CO.

1829 S. 68th St., Milwaukee 14, Wis.



Each BROWN SECTIONAL RACK combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The BROWN SECTIONAL RACK is a simple, durable article built in five styles from standard interlocking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or farther apart, while increases of stock can be met by simply adding more standard units. Built from metal throughout, depreciation is practically nil. SEND FOR BULLETIN NO. 26-B.

BROWN SECTIONAL RACK

BROWN ENGINEERING CO.

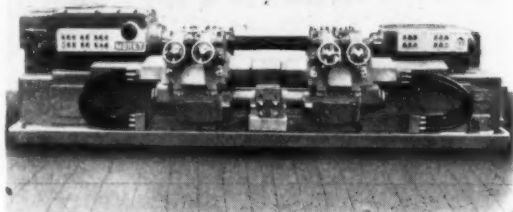
126 N. THIRD ST. READING, PA.

RACKS • VISES • CLUTCHES • COUPLINGS

AUTOMATIC RAILROAD AXLE LATHE

The Automatic Railroad Axle Lathe, designed and built by the Morey Machinery Co., is a hydraulically operated, electrically controlled automatic lathe for rough or finish turning the wheel seat and journal diameters of railroad axles.

Hydraulic power is utilized for all chucking, clamping, feed and traverse movements. An end-drive chucking method is used to hold the axle by hydraulic pressure from the tailstock quill towards the headstock spindle, transmitting the power through wedge type buttons on the spindle flange. Both centers are floating to compensate automatically for any variation of the center drill in the axle. The chucking pressure is adjustable to meet varying driving conditions up to a maximum



total of 50,000 lbs. and the drive is safeguarded against pressure failure by the use of an electrical pressure switch. This end-drive chucking method leaves the center of the machine free for the installation of an automatic loading device.

The extreme rigidity of the machine, which weighs 58,000 lbs., makes it possible to use multiple tooling with tung-

SHARPEN KNIVES up to 160" LONG

With Ease and Accuracy

A new grinder of massive proportions with extra heavy duty construction throughout for precision work. Fully automatic with two motor drive, one 10 HP to drive 16" segmental grinding wheel,— separate 3 or 5 HP for carriage drive. Extra wide V-Ways and transmission bearings automatically lubricated for literally mile after mile of fast, low cost cuts. Smaller sizes down to 48". Ask for bulletin 311.

ROGERS
TYPE NT 160
KNIFE AND FACE
GRINDER



Pioneers
for Over
60 Years

SAMUEL C. ROGERS & CO.

207 Dutton Ave.,

Buffalo 11, N. Y.

sten-carbide tools at their maximum efficiency and assures vibration-free turning of the most eccentric forgings.

The main spindle drive including V-belts, clutch, gears and anti-friction bearings is designed to transmit 150 h.p. at continuous duty, allowing for momentary overloads up to 225 h.p. The complete machining cycle per axle takes between 2 and 3 minutes, depending on size and operation, resulting in a production rate of 200 axles per 8 hour shift.

Close tolerances are maintained on the finished axle, due to the rigid design of all tool slides. These are hydraulically operated, with positive stops inside the feed cylinders, and equipped with a micrometer dial adjustment, which changes the relation between cylinder and slide.

Automatic devices assure uniform quality without guesswork. An automatic compensating device, consisting of a mechanical linkage with a lever ratio of 1:2 connects the tailstock quill to the carriages. This arrangement automatically moves all cutting tools during chucking to a symmetrical position in relation to the axle, with the result that the width of the end flanges on each axle remains the same on both ends, regardless of the overall length which may vary on different axles.

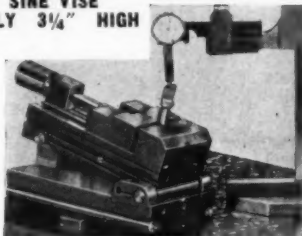
Push-button controls are provided for the automatic work cycle as well as for all individual functions of each machine unit. Due to the length of the machine, the cycle control is duplicated on either end—headstock or tailstock. In addition to these two centralized control panels, the individual controls for each slide are mounted directly on the particular unit which they control.

Hydraulic manifolds with all connections drilled internally are used extensively to replace piping and to reduce the possibility of leakage to a minimum. Control valves are panel mounted to facilitate servicing and maintenance.

For complete information and operational details, write:

Morey Machinery Co., Inc., Dept. BB
4-57 26 Ave.
Astoria-New York 2, N. Y.

**NOW 90% OF ALL COM-
POUND ANGLE
GAGE, TOOL, & DIE WORK CAN BE
DONE WITH THIS COMPOUND
SINE VISE
ONLY 3 1/4" HIGH**

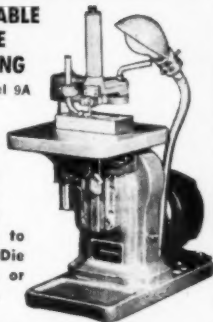


**IT'S RETRACTABLE
80% TIME
SAVING**

Model 9A

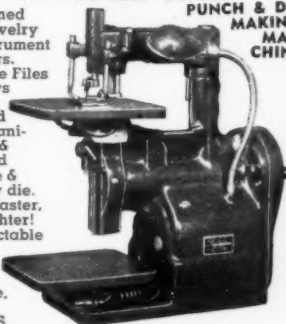
NOTE:

Only 1 second to retract file below die for each inspection & only 1 second to reposition file to work again. No Die lifting over file or saw is necessary.



**SYNCHRONIZED - DUPLEX
PUNCH & DIE
MAKING
MA-
CHINE**

Designed for jewelry & instrument makers. Needle Files & Saws tensioned mechanically & guided above & below die. Cuts faster, straighter! Retractable File & Adjustable Stroke.



**SAVES
80% OF TIME ON PUNCH FITTING
IDEAL TOOL AND DIE CO., INC.
733-35 Congress St., Schenectady 3, N.Y.**

NEW DOALL UTILITY BAND SAWS

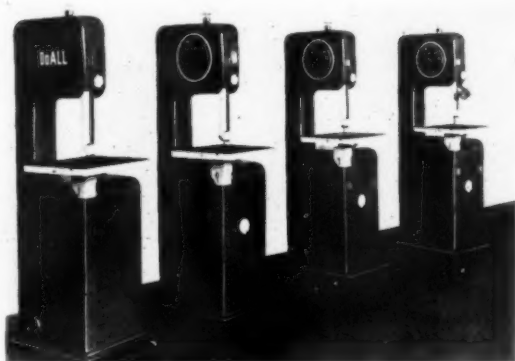
A new series of four sawing machines has been introduced by The DoAll Company, providing fast, accurate cutting of practically any material. These Utility models range in progressive usefulness from the basic single speed woodworking saw to a machine with double range variable speed control, equipped for sawing, filing, and polishing operations.

These machines are for light manufacturing operations in the fabrication of wood, plastic, leather, or sheet metal products. Small firms can profit from the time and material saving offered through band-sawing, as compared with other methods of material removal or shape cutting. As business warrants, conversion of the machine by the addition of accessories will adapt it to their new requirements.

The structural design consists of a shell of pressed steel, completely enclosing all working parts. The frame is rigid, arc welded over die forms and is integral with the shell structure. The motor and drive mechanism are isolated by a steel baffle plate. A saw-dust chute is built in and is emptied from the front. Throat depth is 16"; work thickness capacity is 12½"; table size, 20" x 20"; with a 45° tilt to the right and 5° to the left.

The basic machine in the Utility series is the Model HS, at the left in the illustration. It has one high set-speed or 2 four-speed step pulley drive for cutting wood, plastics, leather, etc.

Next in the line is the Model HSV, which has a variable high speed range of 850-5200 f.p.m., for cutting of aluminum, sheet steel, and light structural forms.



Model LHV (third from left) has both high and low variable speeds (50-300 f.p.m. and 850-5200 f.p.m.), permitting a wide speed range for cutting all ferrous as well as nonferrous materials and alloys.

Model SFP, on the right, has the same speed range as Model LHV, but includes equipment for filing and polishing operations as well as welding of saw bands.

From the basic, general purpose Model HS, the machine can be elaborated with accessories to assist the manufacturer who needs one or two refinements to tailor his machine to meet special requirements, whether sawing, filing, or polishing.

Standard equipment on the DoAll Utility series includes rip fences, circle cutting, mitering, contouring attachments that can be utilized to make the machine fit all job requirements. Specialized saw guides are also available. Complete details and specifications are contained in a new circular

which describes all four models.

**The DoAll Company, Dept. BB
Des Plaines, Ill.**

**PLASTIC SEALING COMPOUNDS
RESIST TEMPERATURES UP TO 2800°**

Two improved thermal barrier materials capable of withstanding temperatures up to 2800° F. have been introduced by the American Latex Products Corp. The sealing compounds, known as Stabond FR 8 and FR 10, are obtainable in various consistencies for application by trowel, brush or extrusion gun, and will find an application in industry virtually wherever a problem of heat resistance or exchange exists.

The new compounds are particularly suitable for application as an insulating material to electrical junction boxes, heat exchanger couplings and similar points. They are useful for lagging steam pipes and hot air ducts wherever resistance to vibration as well as heat is desired. They may also be used as an abrasion resistant coating for electrical systems.

Stabond FR sealing compounds are basically of a plastic nature, and may be used for filleting or applied to a spherical surface. They "cure" by solvent release at approximately 80° F., forming a hard but not inflexible sheath which may be given greater resistance to air and flame abrasion by incorporating additional support, such as perforated glass cloth at the time the sheath is formed.



The illustration shows a 1/2" coating of Stabond FR 10 on a backing of aluminum sheet held on a demonstrator's bare hand while a steel bar is melted on its surface. The oxyacetylene flame was in contact with the

WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

Nos. 1828-1829-1858-1868

**DEEP THROAT
LEVER PUNCHES**

Throats
7"-10"-18"-24"

Capacity
1 1/2" thru 1/8"

Throat Height
6"

Stroke
1"

Write for Catalog
16-48



WHITNEY METAL TOOL COMPANY
115 FORBES ST. * ROCKFORD, ILL.

STERLING DRILL GRINDER



CAPACITY:
3/8" to 2 1/2" drills.
5" x 9" adjustable table.

MOTOR: 1/2 hp,
3450 rpm.

NET WT: 250 lbs.

CRATED: 320 lbs.

MCDONOUGH MANUFACTURING CO.
EAU CLAIRE, WISCONSIN, U. S. A.

Immediate Delivery FROM STOCK

GREAVES-SILENT BAKELITE GEARS

No waiting when you order Greaves Silent Bakelite Gears. • We have them in stock NOW! • Your order will go forward immediately. • You'll appreciate the silent operation and added smoothness provided by Greaves Silent Bakelite Gears. • You'll marvel at their great strength to carry big power loads... their remarkable ability to successfully operate completely submerged in water. • You'll welcome their low cost. • No metal reinforcements required. • Save Time... Money... Labor!

We also make silent gears of rawhide and Fabrolite.

Write for Circular.



Greaves MACHINE TOOL CO.

2013-18 Eastern Ave.
Cincinnati, Ohio

Wanted: Foreman

Tool room employing five men. Factory itself, 125 men. Products, miscellaneous farm equipment items. Also some job press work. Necessary to design dies and fixtures and supervise their fabrication for some 35 mechanical presses, toggle presses, press brakes, and air cushion presses ranging from 5 tons to 250 tons capacity. Give experience, age, family status and salary required.

Address replies to Box B-68

c/o HITCHCOCK PUBLISHING CO.

542 So. Dearborn St., Chicago 5, Illinois

surface of the material for approximately four minutes, the aluminum remained cool enough to be comfortable to the touch.

Stabond FR 8 satisfactorily resists temperatures up to 2000° F. FR 10 has similar properties, but consists of materials having a greater refractive power, and has been tested at 2800° F. for fifteen minutes with satisfactory results. For prompt attention in the solution of heating problems in industry, write:

American Latex Products Corp.,
921 Venice Blvd., Dept. BB
Los Angeles 15, Calif.

INTERNAL WRENCH USEFUL IN INACCESSIBLE PLACES

To eliminate timeconsuming and hazardous digging or chiseling for pipes, nipples, and fittings buried in plaster, sprinkler systems, and other inaccessible spots, the new Roddick Internal Wrench will prove itself useful. The

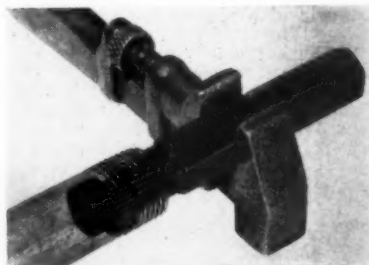


illustration shows the wrench inside a pipe with the cam in place to take hold of the inside of the pipe. The wrench may be turned with an ordinary crescent, socket, or pipe wrench.

The Roddick Internal Wrench is provided in three standard pipe sizes, (1/2", 3/4", and 1"), and can be used to insert as well as to loosen pipe. It is claimed to be exceptionally useful in removing nipples broken off flush inside of pipe.

For details, write the manufacturer:

Roddick Tool Co., Dept. BB
Costa Mesa, Calif.

AUTOMATICALLY FLUTES

- TAPS
- REAMERS
- MILLING CUTTERS

Sharpens metal cutting saws
in gangs

Wardwell Automatic Flute Grinder 50F is completely automatic. Set the reamer or tap in the machine and forget it. Within a few minutes an accurately ground flute is finished.

It indexes automatically and thus can be operated with unskilled labor.



WRITE FOR BULLETIN 50F

THE WARDWELL MANUFACTURING CO.
3165 Fulton Road, Cleveland 9, Ohio

The Bendmore handles material up to 3/32" thick a full 12" wide. Good clean bends up to 135°. The machine is ruggedly constructed of semi-steel castings, the operating cam and steel insert in ram are heat treated to resist wear and give long life. Prompt delivery.

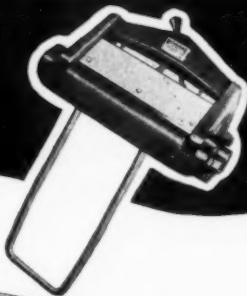
Write for literature. Dept HB

Carl Wirth & Son

1625 CLINTON AVE. N.
ROCHESTER 5, N. Y.

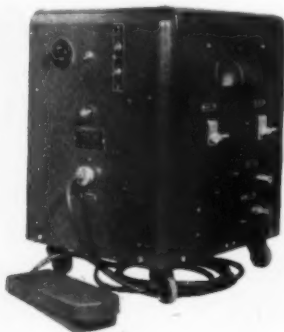
Bendmore

SELF ADJUSTING
BENDING MACHINE



INERT-GAS-WELDING ATTACHMENT FOR A-C TRANSFORMER TYPE WELDERS

A new product of the Hobart Brothers Co., is a High Frequency Stabilizer with added control features to simplify



inert-gas-welding. This unit is designed for use with any standard a.c. transformer type welder of 500 amperes or less. Its overall dimensions are 21" high,

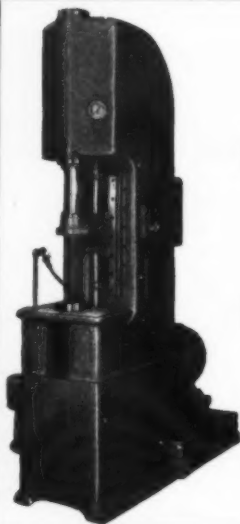
19" wide, and 18½" deep. The unit provides, in addition to high frequency stabilization, other features.

A magnetic contactor turns the welding current and high frequency on and off, and operates the magnetic valves for turning water and gas on and off.

A time relay controls the magnetic valves so that the flow of gas and water continues for a predetermined time (adjustable up to 180 seconds) after the arc is extinguished. This protects the weld metal from oxidation until it has had time to solidify.

A foot switch plugs in the front of the cabinet. In addition, a tumbler switch enables the entire unit to be cut out of circuit so that the welder can be operated alone, as a standard a.c. transformer, without high frequency, water or gas. For complete details, write:

**The Hobart Brothers Co., Dept. BB
Hobart Square
Troy, Ohio.**



The New *Guided Ram* High Speed Hydraulic Press

For Fast Assembly and Broaching

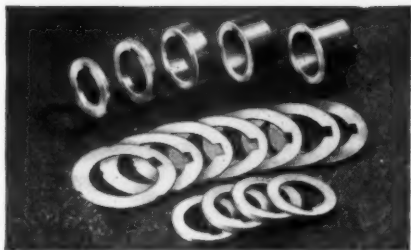
WRITE FOR BULLETIN 357-11

GREENERD ARBOR PRESS CO.

Nashua, N. H.

PACKAGED PRECISION

MACHINISTS HAVE LEARNED TO RELY ON DE-STA-CO Arbor Spacers and Shims for milling, slitting, gang-saw set-ups and for shimmiing gears and bearings. De-Sta-Co long-life steel Spacers are packaged in a standard range of sizes from $\frac{3}{8}$ " to 4" hole diameter, up to $5\frac{1}{2}$ " outside, thicknesses from .001" to .125", all *with keyway*. Shims are stamped and coined to commercial tolerances in the same preferred sizes, *without keyway*.



Special spacers—thicknesses greater than .125"—are also available in popular sizes, machined from bar stock, hardened and ground, with standard keyways and thickness identifications.

Handy spacer kits of 19 graduated decimal thicknesses are stocked by Mill Supply Dealers in principal industrial centers. *Order your Packaged Precision Today.*

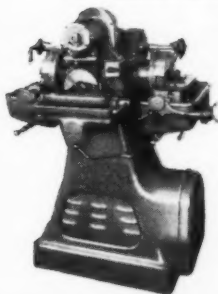
Your De-Sta-Co Toggle Clamp Catalog No. 47 is waiting for you. *Send for it!*

DETROIT STAMPING COMPANY

347 Midland Ave.

Detroit 3, Mich.

HOW TO GRIND CARBIDE CUTTING TOOL BITS ECONOMICALLY



Here's tool grinding at its best!

Employing 3-step progression—rough, semi-finish, and finish or hone—on one machine, this LeMaire 3-Wheel Grinder produces keener edge in fraction of time. Because tools go to diamond wheels in better condition, life of diamond wheels is considerably lengthened. Both labor and wheel costs are reduced—time is saved—production is increased.

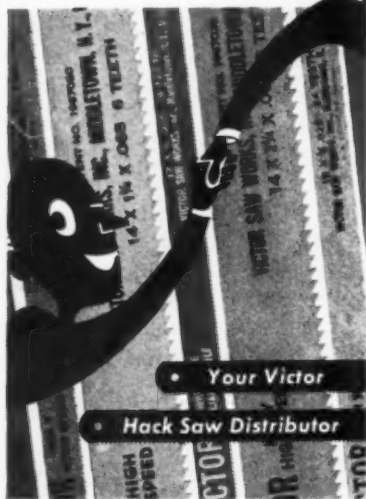
Wouldn't you like to know more about this remarkable 3-Wheel Grinder? Send for descriptive folder.

LeMaire Tool & Mfg. Co.

2657 S. Telegraph Road
Dearborn, Michigan

Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-R Gear Chucks.

meet the best
man to see
about
saws



Get acquainted with your Victor Hack Saw distributor. He'll be glad to show you how to cut metals and non-metals easier and faster, and cut costs too with Victor Hack Saw Blades.

And while you're at it ask him for the NEW Victor Wall Chart for your workshop — the Victor Metal Cutting Booklet for your pocket or tool kit — both are packed full of helpful information . . . ABSOLUTELY FREE.

VICTOR

SAW WORKS INC.
MIDDLETOWN, N. Y.

Makers of hand and power hack saw blades,
frames and band saw blades.

NEW WILTON POWARM UNITS

The Wilton Tool Manufacturing Co. is producing two improved Powarm models, one mechanically operated for light work, and the other hydraulically operated for heavy duty work. Both Powarms position the work at any desired angle on a 360° horizontal or axial plane, or on a 190° vertical plane, and hold the work firm under great pressures. The tools combine the ball-and-socket joint principle with a simple locking device that requires only slight pressure to lock the work in any desired position. Work up to 150 pounds in weight can be held at any angle. Both models are easily bolted to a work bench. A special clamp is also available to attach the Powarm to any convenient location.



The Powarm enables the mechanic to tilt work to the angle best suited for convenience and accuracy. It leaves both hands free, and eliminates the awkward positions that cause operator fatigue and inaccurate work. For full information, write:

Wilton Tool Manufacturing Co.
936 Wrightwood Ave., Dept. BB
Chicago 14, Ill.

Sales of retail stores in June 1948, estimated at \$10,710,000,000 were 13% above a year ago, an increase about equal to the average year-to-year increase in the first five months of 1948.

VISUAL GRINDING SIZE CONTROL

Well known. Visual reading. Grinding size and quality control on cylindrical grinders. Completely adjustable for all grinders. Thousands in daily use in U.S.A. Many in foreign countries.

Diameter, diameter and length, splines, worms. Over 400 special designs for your problems.

FOSTER ENGINEERING COMPANY
4200 WOODWARD AVENUE
ROYAL OAK, MICHIGAN



SPECIFY

Hall...

PRECISION LEVELS

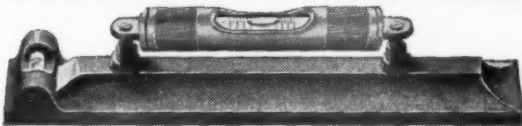


FIG. NO. 5 Adjustable type Machinists' Levels with ground and graduated vial. Grooved for use on shafting. Sizes 4", 6", 8", 12", 18".

"MANUFACTURERS OF
SPECIAL LEVELS
FOR ANY USE."

FIG. NO. 50—For setup and maintenance is accurate to 10 seconds. Graduations are in .0005" per foot. Packed in Instrument Case.

Address Orders or Inquiries to

HALL LEVEL AND MANUFACTURING WORKS

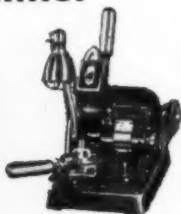
(Established in Geneva, Ohio, in 1913)

1119 E. 4TH

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**If it's a
SMALL PART..
Mill it with a
New Rouse Hand
Miller**

**NEW
Rouse
HAND
MILLER**



**\$98 (Without Fixtures)
F.O.B. Chicago, Motor Extra**

Rouse
Fixture Set-Ups
that Speed Pro-
duction.



parts for instruments, electrical work,
aviation components, etc.

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Write for illustrated circular and
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**H. B. ROUSE
AND COMPANY**

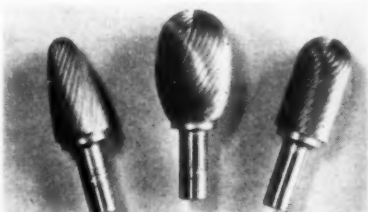
2216 N. Wayne Ave. Chicago 14, Ill.

SEVERANCE CARBIDE MIDGET MILLS

Three new sizes, each the largest of
its respective popular shape, extend
the standard range of the Carbide Mid-
get Mills offered by Severance Tool
Industries Inc.

It is claimed that Carbide Midget
Mills give equal or better finishes on
many jobs than grinding and that dust
protective equipment can be dispensed
with to effect further savings and con-
venience. It is now possible for women
using Carbide Mills in light power
tools which permit better control and
dexterity, to surpass men manipulating
heavier grinders.

Operating preferably at speeds of
2,000 to 5,000 s.f.m., the cutting action
and controllability of Severance Carbide
Midget Mills excels that of similar High
Speed Mills, being aided by the gyro-
scopic balance characteristic of the
higher speed power tools—either air or
electric.



These Carbide Mills speed up pro-
duction over that obtainable from their
High Speed counterparts which they
outlast 30 to 50 times on abrasive and
tough materials. They will also cut
hard materials, up to 63-C Rockwell.
Besides being used in freehand opera-
tions where the tool is applied to the
work manually, they can be chucked
in machines and the work manipulated
either manually or mechanically. For
additional information and performance
data on these Carbide Midget Mills,
write:

**Severance Tool Industries, Inc.
722 Iowa St., Dept. BB
Saginaw, Mich.**

Built like a rock but **EASY** on the budget

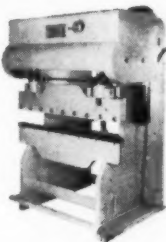
●KNIGHT Press Brakes' features include heavy welded construction, generous bearings, all controls located in front. Micrometer dial permits adjustments to .001". Visible extreme ram position indicators. Many features found only on expensive machines . . . built into these low-cost press brakes designed to relieve your larger, more expensive equipment.

KNIGHT PRESS BRAKES

Available in four sizes: 24, 36, 48 and 60-inch capacities. Equipped with Link Belt anti-friction bearings, Cutler-Hammer controls, Reeves variable pitch pulley drives, Westinghouse motors, Twin Disc clutches. Designed also to facilitate quick and easy repairs and replacements.



◀ **Write FOR**
DESCRIPTIVE CATALOG
No. 9



SPECIAL MOTORS for

Special Jobs!



Get "*Dependable Power*"
with Custom-Built
DOERR Motors!

Although we have been building standard fractional H. P. motors for years, the majority of our production is taken by manufacturers whose basic product design or end-use requires special features. We are providing such service to many leading names in industry, and would be pleased to consult with you on your motor design problems.

Write for Catalog and Prices
76 No. Third St., Cedarburg, Wisc.

ELECTRO
MACHINES, INC.

DOERR
MOTORS

From 1/20 to 2 H. P.

Standard or Designed
to Your Specifications

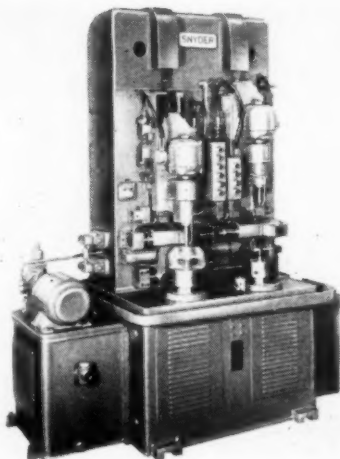
SPECIAL MACHINE FOR CENTER DRILLING AND FACING PISTONS

This special purpose machine, designed and built by Synder Tool & Engineering Co., for center drilling and facing automotive pistons, enables an unskilled operator to process 444 pistons an hour at 85% efficiency. Required floor space is 50" x 44".

The operation consists of center drilling the head end of the piston and facing a portion of the piston head, these surfaces then serving as locating points for succeeding operations.

The machine is equipped with two Snyder standard, hydraulically actuated slide units carrying single spindle heads used for the center drilling operation. Facing slides and tool blocks are mounted on the face of the machine column and are hydraulically actuated in horizontal position.

Two rotating four-jawed chucks are mounted in the machine base directly beneath the centering spindles, two of the four jaws having radial locators. Jaws are hydraulically actuated. Chucks are equipped with a height locator



RUGGED STABILITY

ALLIED Heavy Duty Vise

Designed and constructed for handling tough production jobs.

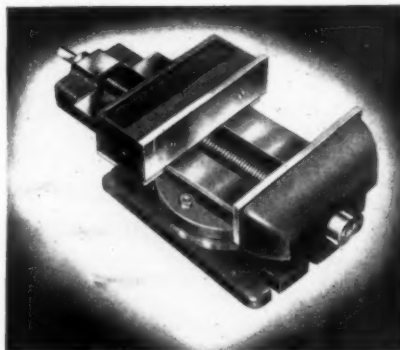
Screw extends thru both ends of vise and is fitted with a thrust bearing nut behind a stationary jaw. This unique arrangement provides greater clamping action on the work being held.

Base is accurately graduated in degrees.

Can be used on millers, shapers, grinders and drill presses.

SPECIFICATIONS

Opening of jaws	13"
Width of jaws	12 $\frac{5}{8}$ "
Depth of jaws	3 $\frac{1}{4}$ "
Overall Length	24 $\frac{1}{4}$ "
3 slots in both end of base with	3 $\frac{3}{4}$ " centers
Approx. weight	260 lbs.



\$225.00
PROMPT DELIVERY

ALLIED MACHINERY CO.
548 W. Monroe St., Chicago, Illinois

which contacts the inside of the piston head and thus establishes a controlled thickness during the top facing operation.

Each cross slide carrying tool blocks has independent hydraulic feed system which permits the operator to load and unload a piston in one side of the machine while the opposite side is machining a piston.

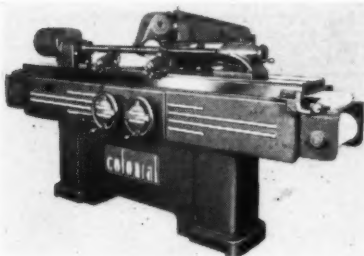
Spindles and chucks are driven through "V" belts and sheaves which are easily changed to alter the R.P.M. of each. Feed rates of center drill and facing slides are adjustable through feed control valves and center spindles. Base and column are welded steel, thoroughly normalized and properly ribbed for rigidity. A hydraulic pump and tank unit are mounted on one side of the base and a coolant tank and chip tray on the opposite side.

Chucks and centering spindles are driven by individual motors. For complete dimensional and operational statistics about this unit, write:

Snyder Tool & Engineering Co.
3409 E. Lafayette Ave., Dept. BB
Detroit, Mich.

NEW COLONIAL LINE OF BROACH SHARPENERS

A complete line of broach sharpening machines, designed to meet requirements of the greatly expanded use of broaching in its various forms, has just been introduced by Colonial



Broach Co. The line comprises seven basic models—two sizes for sharpening flat broaches; three for sharpening

NOW . . . TRIPLE SAVINGS

IN YOUR GRINDING ROOM



HERE'S HOW WITH THE STANDARD BDG

1. Wheel costs are lowered!
2. Time is saved!
3. Production is increased!

Standard's belt driven grinders reflect correct peripheral speeds on wheels at all times down to wheel flanges.

WRITE FOR CATALOG 44 TODAY!

Belt driven grinders from 1 H.P. to 60 H.P.

THE STANDARD ELECTRICAL TOOL CO.
2486 River Road Cincinnati 4, Ohio

round broaches, and two sizes which will handle both flat and round broaches.

The flat broach sharpeners will handle broaches up to 8" wide and up to 32" and 65" long at one setting, respectively. The round broach sharpeners will accept broaches up to 6" in diameter, and up to 36", 72", and 84" long, respectively. They are designed for all types of round broaches, including spline, serration, and other types.

The two universal models will take round broaches having diameters up to 6" and up to 72" and 84" long, respectively, and flat broaches up to 8" wide and 65" and 77" long respectively.

Features include ease of sharpening the broaches, and convenience of operating controls. All grinding wheels and headstocks are equipped with built-in motors. The grinding wheel spindles have a standard speed of 4000 r.p.m., which can be increased to 10,000 r.p.m. through the use of special pulleys. Headstocks on the round and universal type models have 2-speed gearing for spindle speeds of 200 and 400 r.p.m.

The structural rigidity of the machines, together with the precision fitting of all working parts, with a minimum of friction, contribute to ease of operation and accuracy of the work produced on these units. For complete information, write:

Colonial Broach Co., Dept. BB
Box 37, Harper Station
Detroit 13, Michigan

Fuel consumption in the postwar period has surpassed even the heavy fuel requirements of wartime. On a per capita basis, the combined consumption of energy in the form of mineral fuels and the fuel equivalent of water power was only fractionally lower in 1947 than in the peak year of 1944, and more than 40% above the 1935-39 average.

POWER PRESS FEED SELECT-O-MATIC



A revolutionary development in press feeding, utilizing a universal ratchet, which eliminates friction feed units entirely.

Complete roll feeds, or feed unit, sold separately.

Write For Complete Details



FOR QUALITY . . . CALL BASSETT

- Carbide Tipped Gun Drills— for drilling deep holes
- Tools— special tools
- Gages— accurate, precision built

Write Today For Full Information

BASSETT BROS.

37 Warfield St.
Devon, Conn.

Telephone
 Milford
 4-1871

Maximum Production . . . in Chucking and Indexing



With the new **Dearborn Automatic Indexer** connected to a **Dearborn Chucking Fixture**: chuck is closed **automatically**; indexed the required number of times **automatically**; chuck is opened **automatically**; piece is knocked out **automatically**.

When used with the **Dearborn Degree Indexing Fixture** it can quickly be set to index any number of degrees from 30° to 90° at one indexing and then knock out, or it can be set to index from 90 degrees to 90° and then not knock out.

WRITE FOR FURTHER INFORMATION

J. W. DEARBORN

ANSONIA, CONN.

SUPER-SPACER

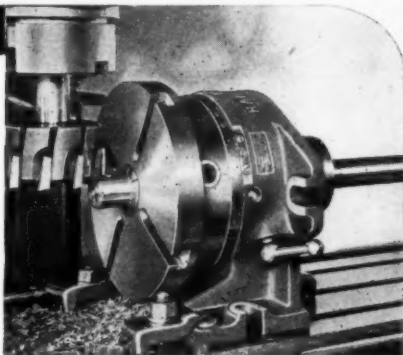
FOR MILLING

The uses of the Super-Spacer in horizontal and vertical milling operations are unlimited. Here the Super-Spacer, mounted with a face plate and draw-in collet combination, shows its adaptability for milling bar stock. Investigate your present milling methods and see if your shop can't profit by the speed and accuracy of the Super-Spacer.

For complete details write Dept. S7

Special Machinery

HARTFORD SPECIAL is equipped to build from prints almost any type of special machinery, parts or operations. Our facilities give your shop an added capacity. Bulletin E-200 gives complete list of our Machinery Equipment and capabilities. We'd be glad to send you one.



HARTFORD

Special

THE HARTFORD SPECIAL MACHINERY CO. HARTFORD 5, CONN.

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RIGHT NOW**



ON GEARS?

Abart

Phone, wire or write
Gear & Machine Co., GEAR SPECIALISTS.
For immediate attention. Any quantity, large or
small. Send B/P or samples, for prompt quota-
tion.

Cut only to specifications. No. stocks.

Spur—96 D.P. to 5/7
D.P. 1/4" P.D. to 18"
P.D.

Bevel—48 D.P. to 5/7
D.P. Max. P.D. 20"
Max. ration 4:1

Worms—32 D.P. to 5/7
D.P. 1/2" P.D. to 5"
P.D.

Worm Wheels—32 D.P.
to 5/7 D.P. 1" P.D. to
14" P.D.

Helical & Spiral—96
D.P. to 6 D.P. up to
14" P.D.

Sprockets—1 1/4" dia. to
14" dia.

Abart GEAR & MACHINE CO.
4832 W. 16th St., Chicago 50, Ill.
Phone ROCKwell 2828

**STANDARDIZE ON
ACE DRILL JIG
BUSHINGS**

When you order drill jig bushings, there's no doubt about what you want. Assured precision, a source that offers you immediate delivery on a full range of standard sizes and prompt service on specials—ACE Gives You All This. REMEMBER—LARGEST STOCK IN THE WEST—IMMEDIATE DELIVERY ON STANDARD SIZES—FASTEST SERVICE ON SPECIALS.

ACE drill jig bushings are now available through distributors from coast to coast.

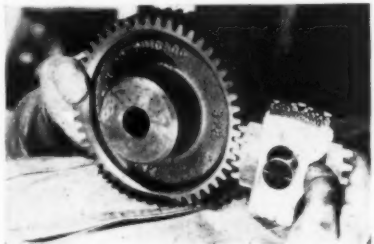
Ask for catalog containing the exclusive "TIME SAVER TABLE"

<p>The General Tool Company 315 N. W. 13th Avenue Portland 9, Oregon Production Tools, Inc. 1435 Imperial Avenue San Diego 2, California Valley Foundry & Machine Works, Inc. 710 H Street Irvine, California</p>	<p>Durant Tool Supply Company 155 George Street Providence 3, Rhode Island Pacific Tool and St. ply. Co. 231 Eighth Street Oakland, California Production Products Co. 524 First Avenue South Seattle 4, Washington</p>
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If no distributor is yet serving your area,
write, wire or phone your order today to
WEST COAST AERO TOOL CO.
5405 Fountain Avenue, Los Angeles 97, Calif.

**NEW 20-DEGREE PRESSURE ANGLE
GEAR GAGE**

A new Gear Gage has been added to the line manufactured and distributed by the George Scherr Co. Previously available only in 14 1/2° pressure angle, the stainless steel Gear Gage is now made with 20° pressure angle, full length tooth form 3-4-5-6-8-10-12-16-20-24-32-48 and stub tooth forms 3/4 - 4/5 - 5/7 - 6/8 - 8/10 - 10/12 - 12/14 - 16/21 - 20/26 - 24/32 - 32/42 - 48/64.



These Gear Gages are used for a quick check of gears. As illustrated, the Gear Gage eliminates the tedious calculation and computation required to determine the pitch of a gear with unknown pitch. By merely rolling the gage over the teeth of a gear, the operator can determine instantly the pitch without chance of error.

Request full information, from:
George Scherr Co.
200 Lafayette St.
New York 12, N. Y.

USEFUL DECIMAL-FRACTION CALCULATOR

A new decimal - fraction calculator has recently been developed by the Wendt-Sonis Co. This ingenious device is designed for use in adding and subtracting fractions, and converting fractions to their decimal equivalents, or vice versa. Calculators may be obtained by writing the:

Wendt-Sonis Company
Dept. BB
Hannibal, Missouri

HERE'S A MACHINE

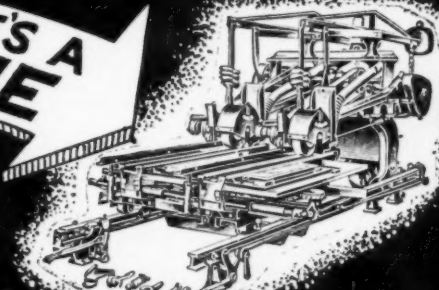
FOR
GRINDING and POLISHING

Stove Tops
Auto Bumpers
Electric Irons
Stainless Steel
Sheets

AND
Other Products

Excelsior

TOOL & MACHINE CO., EAST ST. LOUIS, ILLINOIS



EXCELSIOR
No. 27

AUTOMATIC
GRINDING and POLISHING
MACHINE

MODEL
175
HYDRAULIC
MARKING
MACHINE



MARK IT for MARKET

Modern Marking Machines now enable most manufacturers of metal components to identify their products at trifling costs. **TRADE MARKS — MANUFACTURER — PART NUMBERS PERMANENTLY ROLLED ON YOUR PRODUCTS** will help you market them.

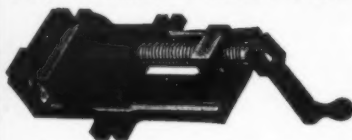
Send prints of parts, showing required marking and its location on part with hourly production for free recommendation.

Write for Catalog

GEO. T. SCHMIDT, INC.
1802 W. Belle Plaine Ave.
Chicago • 13 • Illinois



YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, inches	Open Inches	Weight Pounds
1B	3 1/2	3 1/2	12 1/2
2B	5	5 1/2	23

Do you need a vise of ANY type?

Write today for bulletins on the extensive Yost line

YOST MFG. COMPANY

1335 SO. MAIN ST.
MEADVILLE, PENNSYLVANIA

DERBYSHIRE



Fine Precision Instrument **LATHE**

WIRE CHUCKS

.004" capacity to

MAGNUS-ELECT — .315"

D. LARGE — .250"

D. WEBSTER-WHITCOMB — .196"

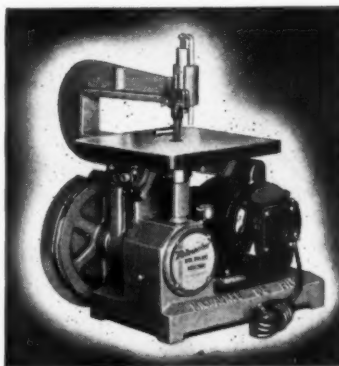
STANDARD ACCURACY
.0002" ECCENTRICITY

F. W. DERBYSHIRE, INC.

Waltham 54, Massachusetts

BENCH FILING MACHINE EQUIPPED WITH ALL-PURPOSE OVERARM

A new bench-type reciprocal filing machine, the Milwaukee Die Filer, Model FS, performs all three die making operations, filing, sawing, and lapping, without changing overarms. This versatility is the result of the deep-throated, all-purpose overarm equipped with an upper chuck in the overarm assembly. This makes it possible to chuck files, saws, or lapping sticks at the upper, as well as the lower, end. Spring tension on saws and thin files is adjusted by moving the overarm chuck assembly up or down.



The new overarm also permits chucking close to the work piece, thereby assuring absolute rigidity of saws and files. The overarm can be instantly released and swung clear of the table for the inspection and checking of the work piece.

The lower chuck of the machine is another feature which promotes precision workmanship. A ball joint permits perfect alignment of files with warped, crooked or twisted shanks before they are rigidly clamped in working position. Caps have serrated faces, with V-grooves, to grip and align files, saws or stones of any size or shape.

An adjustable stop assures immediate return to the original setting. The work table is mounted on two brackets, and

may be tilted 15° in four directions for accurate filing or sawing of compound angles. An adjustable hold-down finger holds the work flat against the work table in any position.

An illustrated bulletin covering the Milwaukee Die Filer, Model FS, is now available from the manufacturer:

Rice Pump & Machine Co., Dept. BB
1027 So. 40th St.
Milwaukee 4, Wis.

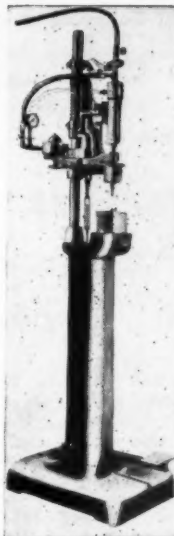
NEW AUTOMATIC PARTS WASHER

A new and safe principle of mechanical parts washing has been introduced by The Protectoseal Co. Known as the "Air-Matic", this automatic parts washer offers complete fire protection in the use of flammable cleansing solvents. The "Air-Matic" is compact and portable, and can be set up beside production machines or in maintenance and repair shops.

The washing of parts is achieved by moving a perforated basket, with contents, up and down through solvent, and not by forcing air into the solvent, and thereby creating dangerous vapors.



This produces negligible turbulence, therefore permits a considerable degree of flow of liquids over the parts. Tests prove this lack of turbulence is a safety factor, since fewer explosive



PNEU-SPIN RIVETER

*fully
pneumatic*

AIR MOTOR

Interchangeable heads
with Capacities: 3/32",
5/32", 1/4" and 3/16"

Speeds 4,000 to 10,000
stroke blows per minute
... Assembles metals,
wood, rubber, die cast,
fibre, porcelain, plastics,
etc. ... Throat depth
4 1/4" ... Motor consumes
6 c.f.m. @ 25 p.s.i. ...
Send unriveted sample
parts or prints for quota-
tion.

Write for Bulletin 48

SCHLACK

Manufacturing Co.

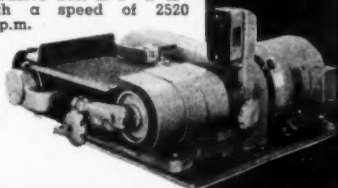
13257 Birwood
Detroit 4, Michigan

Peerless...

This 6" wide bench sur-
face cleans and finishes
castings, dies, stampings
and any other work which
can be ground. It can be
used to achieve flatness,
sharp edges and is ideal
for de-burring and other
clean up operations.
Heavy construction, ball-
bearings throughout.
Abrasive belt is 6" x 42"
with a speed of 2520
s.f.p.m.

BENCH SURFACER

No. 606
6"



PRODUCTION MACHINE CO.
GREENFIELD, MASS.

vapors are created from the flammable solvent.

A reciprocating air engine eliminates the hazard of spark igniting flammable vapors, which could occur with an electric motor. Should the contents of the washer become ignited, the cover automatically closes and extinguishes the fire. The "Air-Matic" will operate on any compressed air supply. The unit is furnished complete with all necessary attachments.

For additional information, write:
The Protectoseal Co., Dept. BB
1920 S. Western Ave.
Chicago 8, Ill.

ROYAL MICRO-BEAM DRAFTING COMPASS

This ingenious device can be adjusted quickly and with precision to any radius within the range of its own scale. Its accurate construction consists of two parallel rods plus a head and a foot. The upper rod or scale, is graduated in 32nds of an inch, and is held rigidly by the head and foot pieces

to the lower rod which rotates in the foot of the instrument. The adjusting screw (lower rod) is threaded $1/32"$ pitch, and is engaged by a relief plunger integral in the head of the instrument, and released by a press button.



Rapid adjustment of the compass is obtained by pressing the button and turning the sliding scale to the desired radius; fine adjustment is secured by turning the lower rod with the fingers. The device can be set precisely and accurately in a few seconds. The Royal Micro-Beam is available in 6", 12" and 18" radius models. For complete instructions and data, write:

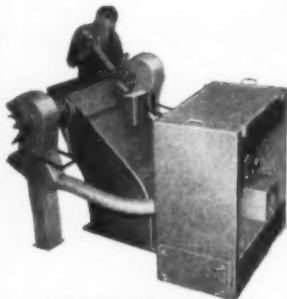
**The Royal Oak Drafting Instrument
Company**
309 South Troy St., Dept. BB
Royal Oak, Mich.

* **DUCTLESS DUSTKOPS** can usually be installed in twenty minutes.

S T O P D U S T S

HOW? ... with DUSTKOP

WHEN? ... within 20 minutes*



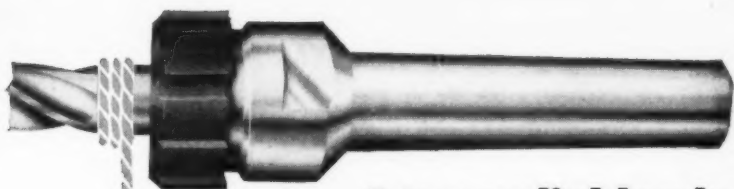
Model 1150 illustrated

■ **DUSTKOP** stops abrasive and fire-hazardous wood, rubber and similar combustible dusts. **DUSTKOPS** are firesafe. (Built of steel and non-inflammable spun glass). **DUSTKOPS** have high suction, big dust storage capacity, with space-saving compactness plus high efficiency dust separation. Unit-type **DUSTKOPS** save power: operate only when needed. Complete line of **DUSTKOPS** for all dusts.

*Send Us the Details of Your
Dust Problem* _____

AGET-DETROIT CO.

205 Main at Washington
Ann Arbor, Michigan



**1 ton radial loads
can't budge tools
gripped in UNIVERSAL
COLLET CHUCKS**

UNIVERSAL ENGINEERING CO.
FRANKENMUTH, MICHIGAN

WILLEY'S

• Standard tools carried in stock for immediate delivery. Special tools built to your specifications.

Catalog gives full information on standard tools and blanks, as well as special tools, gages, centers, centerless grinder rests, diamond tools and other special articles.



GENERAL PURPOSE TUNGSTEN CARBIDE TOOLS



NOW!
By the Box

Get Willey's Standard
Tools by the box.
Handy

Write for
CATALOG 30

WILLEY'S CARBIDE TOOL CO.

SOLE MARKERS OF WILLEY'S METAL

1342 W. Vernor Highway

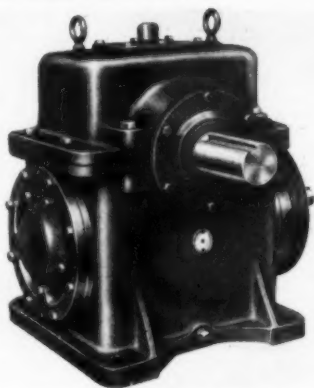
Detroit 1, Michigan

FOOTE HYPOWER ENCLOSED WORM GEAR DRIVES

Foote Bros. announces a new line of enclosed worm gear drives in both horizontal and vertical types. These Hypower units are smaller in size than conventional drives of equal capacity. Because of their high thermal capacity, due to the immersion in the oil reservoir of an air channel cylinder through which passes a high velocity stream of cool air, they permit the use of a smaller, less expensive reducer.

Increased low carrying capacity is accomplished by means of a new technique in generating gears. Leakage of oil is prevented by the use of carbon lapped ring type seal.

Foote Bros. Hypower worm gear drives are available in horizontal (illustrated) and vertical types in single and double worm gear reduction, in a wide range of standard ratios. These units comply with the speed-ratio standards adopted by the A.G.M.A. and the N.E. M.A. Bulletin HPA, fully describing the new units, and containing ratings and



dimension tables is available on request

Foote Bros. Gear & Machine Corp.
4545 S. Western Ave., Dept. BB
Chicago, Ill.

SAVE TIME and MONEY with



MARSHALLTOWN THROATLESS SHEARS

Here's the shear that offers best performance features. Cutting speed 6' per minute. High grade tool steel cutters. Prompt shipment.

*Send Today For Special
Information Bulletin*

MARSHALLTOWN MANUFACTURING CO.
910 E. Nevada St. Marshalltown, Iowa

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NO STRINGS ATTACHED



6
LIBERAL JARS
DIFFERENT
GRADES



A VALUABLE KIT

Carton contains 6 grades of ultra-fine quality, assorted fine grit abrasive compounds suitable for a variety of work. Coarser grit compound available.

FOR PRECISION LAPPING

Here's a get-acquainted offer you cannot afford to miss. Among these samples will be found the answer to many a tool room lapping problem. Hard and soft abrasives for all kinds of lapping needs. Sent post paid anywhere in the U.S.A. and Canada. No obligation—write today.

PROVE THEM AT OUR EXPENSE!

OFFER LIMITED
Write today

UNITED STATES PRODUCTS CO.

522 MELWOOD ST.



PITTSBURGH, PA.

NICHOLSON FAST-ACTING 2-WAY VALVES

Save Muscle

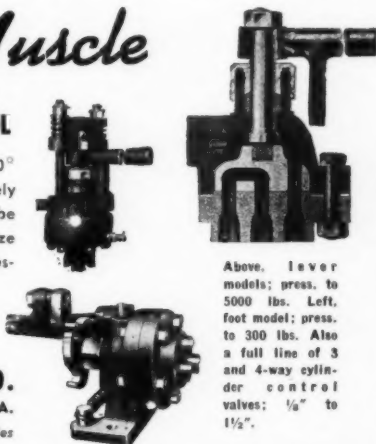
IMPROVE PRESSURE CONTROL

Turning on or off instantly with 60° lever travel, Nicholson valves are widely used as replacements for gate or globe valves. Save time and labor, minimize the differential between opening and closing pressures. 6 metal combinations for all mediums. CATALOG 546.

W. H. NICHOLSON & CO.

117 OREGON ST., WILKES-BARRE, PA.

Valves ★ Traps ★ Steam Specialties



Above, lever models; press. to 5000 lbs. Left, foot model; press. to 300 lbs. Also a full line of 3 and 4-way cylinder control valves; 1/8" to 1 1/2".

New! famco Power SQUARING SHEARS



\$480⁰⁰
and up
(LESS MOTORIZATION)

Rear View of Power Drive Mechanism (Guard Removed)

QUALITY FEATURED AT A NEW LOW PRICE

- Saves equipment investment for departments and shops doing light work.
- Low initial cost . . . economical to operate.
- Sturdily built throughout . . . powerful gear drive. Cuts up to 18 gauge mild steel.
- Has non-repeat (single-stroke) mechanism, easily set for continuous operation when desired.
- Infield, precision-ground high carbon tool steel blades regularly furnished. High speed blades available at additional cost.
- Easily adjustable front and back gauges, hold-down, and guard furnished as standard equipment.
- Three sizes . . . 36", 42" and 52" cutting widths.

This new Power Shears is the latest addition to the Famco Line of cost cutting machines, intended to meet the growing demand for lightweight, low-cost power machinery. For information about the complete Famco Line, write to—

FAMCO MACHINE CO.
1320 RACINE ST. • RACINE, WISCONSIN

famco  **machines**

ANVIL PRESSES • FOOT PRESSES • POWER PRESSES
FOOT SQUARING SHEARS • POWER SQUARING SHEARS

VIBRATORY VERTICAL BOWL FEEDERS

By applying electro-magnetic vibration to a bowl container, it produces a circular traveling and climbing motion of small pieces, parts, or bulk powders, etc. By having a spiral, grooved track ramp up the inside of the wall of the bowl, these small pieces can be fed one at a time in a predetermined manner to a machine, to packages, for inspection, for counting, and for assembling to other parts. The illustration shows how small parts can be fed, one at a time.



The speed of feed and starting and stopping of flow can be readily controlled. The size of the piece to be handled, particularly the length, determines the arc of the grooved track, consequently, the size of the bowl. Used as a feeder machine for powders, etc., it will feed down to extremely small quantities and stream size, furnishing its own vibrated bowl supply hopper. Information is available from:

Syntron Co., Dept. BB
300 Lexington Ave.
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● **PORTABLE**
● **ELEVATING TABLE**



**Saves
TIME
and
LABOR**

- Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height up to 15½", leaving operator's hands free. Table swivels and locks in any position.

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Adapted for heavy duty work. Precision type ball and roller bearings assure maximum capacity for high speed production and long service.

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Yohe Racks take less floor space, hold more stock and require less lifting. Four arm rack, 51" high stacks, 10,000 lbs. Five arm rack 57" high holds 12,000 lbs. flat or round stock—at safe lifting heights. Use against wall or back-to-back in center of room.

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SERVING INDUSTRY FOR 34 YEARS

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Faster finishing of multi-machined precision parts.

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- Special high speed circular, dovetail, flat form and special tool bits.
- Design and manufacture of small machines, jigs, gages and experimental parts.
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Saves time, eliminates diamond dressing. Comes changed in seconds. Available in 2 sizes $\frac{1}{2}$ " and $\frac{3}{4}$ " Cent-R-Laps and abrasive Cones.

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20" Long x 12" Wide x $\frac{1}{4}$ " Deep
16 Ga., drag holes, handles both ends.

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1/16" — 3/32" — 1/8" — 5/32" — 3/16" — 7/32" — 1/4" — 3/32" — 5/16" — 11/32" — 3/8"
ARE STANDARD DIE SIZES—USED
FOR STAMPING NUMBERS & LETTERS

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INTO NAME-
PLATES AND
PARTS OF STEEL,
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STAINLESS STEEL,
BRASS, ALUMINUM
PLASTICS AND ALL
OTHER MATERIALS



**TERRIFIC
SCREW PRES-
SURE SINKS
UP TO 3/8"
CHARACTERS**

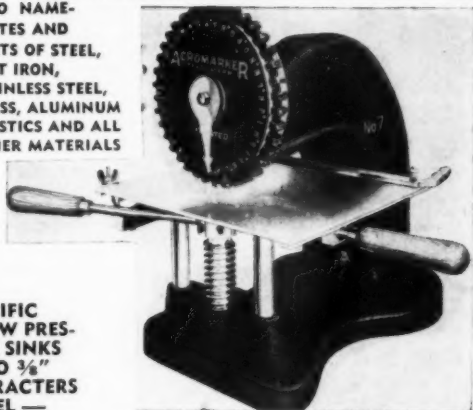
**INTO STEEL —
JUST SWING
HANDLE FROM
LEFT TO RIGHT.**

**MADE BY THE
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MARKING AND
NUMBERING
MACHINES, STAMPS,
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PLATES, METAL
SIGNS, BRANDING
IRONS, BADGES,
PORCELAIN
ENAMELED IRON
SIGNS, TOOLS AND
MACHINES FOR
MARKING ALL
MATERIALS**

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**THE
ACROMARK
Company**

15 MORRELL ST., ELIZABETH 4, N. J.



NEW TINNEMAN SELF-LOCKING NUTS

Designed to improve and speed the crating of stoves, refrigerators, and other heavy objects, a one-piece Speed Nut, replacing spanner washer, lock washer and ordinary nut, has been developed by Tinnerman Products, Inc.

The product is a self-locking nut which has a prevailing torque and, when tightened in position, has an exerted pressure on the threads to withstand vibration. It requires no supplementary parts for resisting vibration. The new Speed Nut is made in two sizes, 5/16th and 1/4th inch. The 5/16ths size will withstand tensile loads in excess of 2,500 pounds.

Elimination of both spanner washer and lock washer assures much greater speed in crating assembly. Use of the new Speed Nut in crating will mean faster, more efficient crate assembly, and the stocking of fewer parts. Write for details to:

**Tinnerman Products Co., Dept. BB
2060 Fulton Road
Cleveland 13, Ohio**



STEPPED UP
PRODUCTION
COSTS DOWN

with
**CAPEWELL
TECHNITE
HACK SAW
BLADES . . .**

Companies with important delivery schedules to meet are relying more and more on Capewell's *Technite* for their hardest cutting jobs. They have found that *Technite* cuts tough alloy steels faster, yet lasts longer than ordinary blades. Deliveries are made on time because production is speeded up . . . yet costs are kept down because of the longer life of *Technite*. Ask your distributor for *Technite*.

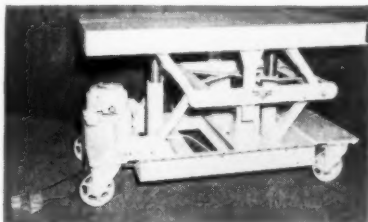
The **CAPEWELL**
1881
Manufacturing Co.
HARTFORD 2, CONN., U.S.A.
METAL WORKING CRAFTSMEN FOR OVER 65 YEARS

LYON-RAYMOND SHEET FEEDING TABLE

To supplement their line of Hydraulic Elevating Sheet Feeding Tables, Lyon-Raymond Corp. has designed a new 10,000 pound capacity unit which has a 16" range of elevation. The top of this new Model 66 table is 36" wide by 66" long. Side extensions can be provided which will increase the width to 48" and end extensions are available which will extend the length to 96".

For many sheet feeding jobs a 16-inch lift was desirable because shorter and more compact bundles were being handled as 5 ton loads. The new table has a lowered height of 26" and an elevated height of 42", so that the top of the pile can always be maintained at press bed height until the last sheet is handled.

The table is portable and can be loaded in a storage area and maneuvered into place by an industrial power truck for which a towing eye is provided. Two 8" swivel casters with Timken Bearings provide easy steering. The two rear wheels are 10" in diameter and are equipped with ball bearings. Standard equipment includes a two-speed foot pump with 5 feet of hydraulic hose so that it can be positioned near the operator during the sheet feeding operation. A floor lock is also provided.



The photograph shows the table equipped with the optional $\frac{3}{4}$ h.p. motor driven pump with a foot operated switch. For complete information, write:

Lyon-Raymond Corp.
6210 Madison St.
Greene, N. Y.

OPTICS FOR GRINDING

Check YOUR CARBIDE
TOOL ANGLES
with



OPTI-CHECK

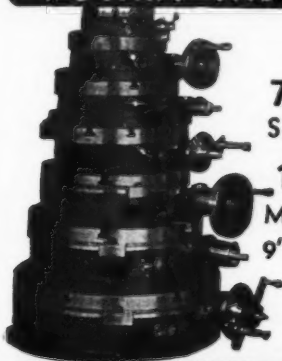
- Magnifies Tool
- Magnifies Reading
- No Fussy Juggling
- Accuracy $\frac{1}{4}$ Degree
- Makes Duplication of Sharpening Angles Easy.
- Checks Drills, Cutters, etc.

Write to

STERLING MFG. CO.

Successors to The Benton Company
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SAVES TOOL MAKERS' TIME T R O Y K E ROTARY TABLES



7
SIZES
10
MODELS
9" to 25"



Catalog on request
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Joints may be fitted to specification, or with —



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Fitted to exact specification
at a guaranteed saving per unit.

- Short stubby jaws for maximum strength and economy of space
- Made from heat treated alloy steel for maximum physical properties
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- Sizes over $\frac{1}{4}$ " O.D. have grease reservoir, an Atlas exclusive
- Send blueprint for quotation, or write for catalog. Large stock on hand



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120 SUFFIELD STREET
In the West: Link Belt Co., Los Angeles, San Francisco
Portland, Seattle, Oakland, Spokane, Dallas

REDUCE CLAMPING COSTS WITH THAYER CLAMPS

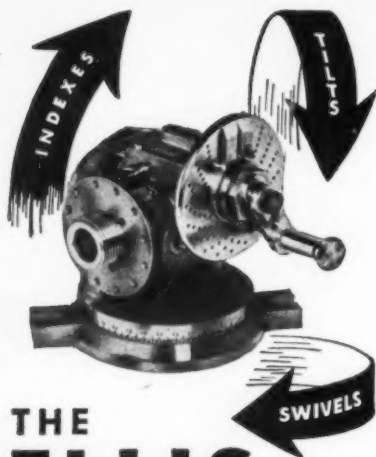


Thayer fast-action clamps are reducing clamping costs in many branches of the metalworking industry. They are of rugged construction and, due to the utilization of hardened bushings, have a long life. They are precision built for heavy duty work.

Full size template sheets sent on request.

Write for Full Information.

C. E. THAYER MACHINE & MFG. CO.
307 Bird Avenue Jackson, Michigan



THE ELLIS DIVIDING HEAD

Many unique features make the ELLIS Dividing Head more than an ordinary indexing fixture. It is a precise, rugged unit with 6½" normal swing increased to 11" swing through the use of riser blocks. It TILTS more than 100 degrees in the vertical plane—SWIVELS 360 degrees in the horizontal plane—INDEXES by crank, or directly by hand. Work is held between centers, or in chucks or collets. The ELLIS Dividing Head is a universal work head that will increase the production versatility of your milling machines, grinders, drill presses and jig borers—write for complete details today.

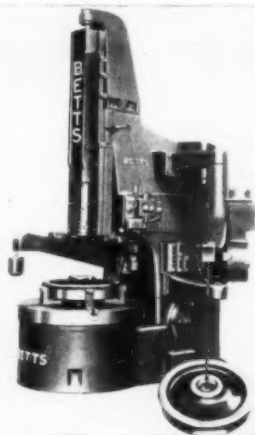
**NICHOLS-MORRIS
CORPORATION**

42-A CHURCH STREET,
NEW YORK 7, N. Y.

NEW DESIGN CAR WHEEL BORER

Consolidated Machine Tool Corporation offers a new high speed Betts Hydraulic—Feed Car Wheel Boring and Hub Facing Machine. Push buttons and control levers are conveniently grouped for simplicity of operation. Features incorporated in the unit include an automatic table brake in conjunction with the automatic feed and traverse cycle, Timken table spindle bearings and anti-friction bearings throughout the drive. The table stops automatically before the spindle starts its upward traverse in order to prevent scoring of work. A square lock boring ram with adjustable gibs on each side is designed to maintain accuracy.

The machine is provided with high speeds for use of carbide tools as well as a suitable range for high speed steel tools; automatic speed reduction is furnished electrically between roughing and finishing speeds when desired, making it possible to use a combination of both carbide and high speed steel tooling. The table of the machine is sealed for use of coolant if desired.



The capacity of this machine is 17" to 48" cast iron or steel wheels using 5-jaw automatic self-centering chuck. The machine in the illustration is

equipped with one electric hoist; either one or two electric or pneumatic hoists may be furnished.

For further details, write:
Consolidated Machine Tool Corp.
Dept. BB
Rochester 10, N. Y.

UNIVERSAL WRENCH FOR STEEL DRUMS

The new Aero No. 5001 Universal Type Wrench is provided with sockets and lugs so placed as to fit all standard steel drum closures. It also is equipped



with a steel lip for removing steel caps over drum closures. The wrench will fit male, female, and hexagon drive closures, as well as those driven by internal lugs. The tool is made of cast

steel, cadmium plated to resist corrosion and sparking. For details, write:

Aero Tool Co., Dept. BB
6930 Avalon Blvd.
Los Angeles 3, Calif.

A & A CAST IRON PULLEYS

Available in 26 sizes and 101 combinations of groove diameter and bore, a new line of close grained grey iron pulleys has been announced by A & A Machine Co.

The bores are absolutely concentric with the grooves, and are furnished with a keyway and Allen set screw. All groove angles are held to 34°. V-belt slippage is minimized. All pulleys are shot peened to provide a smooth surface and to skin-harden the surface.

The manufacturer claims that these cast iron pulleys provide a desirable flywheel action unobtainable with pulleys of lighter materials. All sizes are available from stock. Bulletin available on request.

A & A Machine Co., Dept. BB
Warsaw, Indiana

PARTS DRAWN OF STAINLESS STEEL OR OTHER METAL PARTS PRODUCTION



HERE'S WHAT WE CAN DO FOR YOU.
We are equipped to produce at low cost, deep draws in stainless steel, aluminum, sheet steel, etc. It is routine production to hold wall thicknesses and tolerances to close limits. Therefore, it is possible for us to adhere to the most exact specifications. We are producing Stainless Steel pen and pencil caps for one of the leading Manufacturers and many other items for varied industries.

Write for further information

PARTS SHOWN ONE-HALF SIZE

KANKAKEE TOOL AND DIE WORKS, INC.
MFRS. OF METAL PARTS - DEEP DRAWING - STAMPING - FORMING

367 SCHUYLER AVE.

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KANKAKEE, ILLINOIS

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NUMBERALL

CUTS THE COST OF STAMPING NUMBERS

New Model 70

Multi-Wheel Numbering Machine

Machine and Shank
All One Piece.

The most efficient method of stamping numbers into metal. Repeats the same numbers until changed. Model 70 NUMBERALL Machines are used in all industries to mark various parts. Stamps numbers, etc. quickly . . . neatly. Perfectly aligned. Much better marks are produced by these machines than by single stamps or steel type, and at a far lower cost. Shank for Hand or Press and with any number of wheels from 3 to 20.

Write for
Bulletin BB-70.

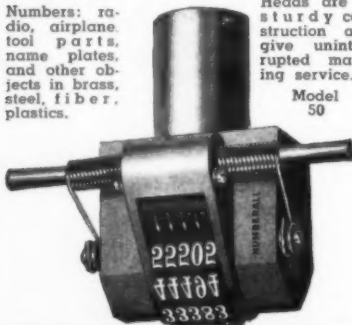
AUTOMATIC INDENTING NUMBERING HEAD • MODEL 50

Automatic indenting numbering head for consecutive or repeat numbering 1/32" to 3/8" high figures can be furnished in sharp face Gothic or shaded Roman figures. Prefix or suffix letter wheels. Bench, foot, or power presses can be used.

Numbers: radio, airplane, tool parts, name plates, and other objects in brass, steel, fiber, plastics.

Heads are of sturdy construction and give uninterrupted marking service.

Model
50

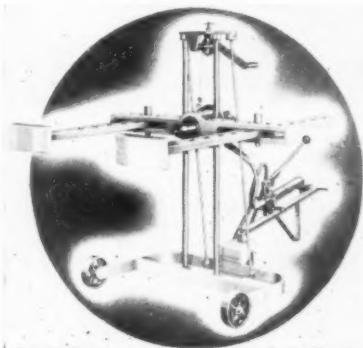


NUMBERALL STAMP & TOOL CO.
HUGUENOT PARK STATEN ISLAND 12, N. Y.

HYDRAULIC PULLER REMOVES OBJECTS FROM SHAFTS

Of interest to the electric motor service shop and plant maintenance departments is the introduction of the new portable puller manufactured by Industrial Engineering Equipment Co.

The Hydraulic Pulley Puller saves time and labor. It is of sturdy, all-steel construction, and can be easily operated by one man. The device can remove almost any object from a shaft in a matter of minutes. Even rusted, fast-stuck pulleys and gears slide off. No crowbars, sledges, nor blow torches are necessary, thus damage to equipment is virtually eliminated.



Pressure is supplied to the hydraulic jack by a hand pump. Three simple adjustments set the puller to the dimensions required. The beams, arms, jack and pump can be removed from the puller stand for overhead or other special uses.

Two models are available—the large size, mounted on wheels and exerting 20 tons pressure, and the small size on a flat stand rated at 5 tons capacity. A special ram adapter can be obtained to handle shafts of nearly any diameter. For complete information, write for illustrated 4-page Bulletin, No. 100, to:

Industrial Engineering Equipment Co.
122 E. Fourth St., Dept. BB
Davenport 2, Iowa

Standard Since 1911



INCLINABLE POWER PRESSES

5 to 79 tons

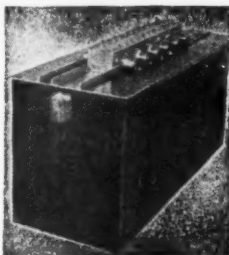
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GEARED TYPE**

Write for
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ROLL FORMING MACHINES AND ROLLER DIES



Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery—

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**ALL CLAMPS ARE HARDENED &
GROUND ON 3 FACES & HELD TO
.0005 TOLERANCE**

ELIMINATING PARALLELS & STRAIN
ON MACHINE. THEY LOCATE &
CLAMP WORK EASILY, BETTER,
IN LESS TIME.

No. 375— $\frac{3}{8}$ SCREWS IN SETS OF 3—\$16.50
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No. 500— $\frac{1}{2}$ SCREWS IN SETS OF 3—\$21.00
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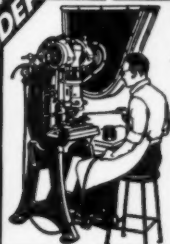
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LITTELL

Pres-Vac
SAFETY FEEDER
KEEPS
HANDS
OUT OF
DANGER ZONE

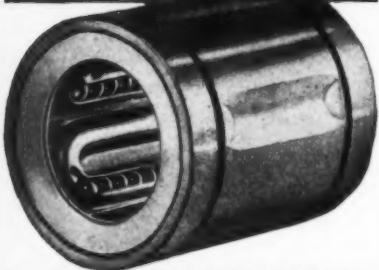


YOU owe it to your workmen—to safe,
fast production—to keep their hands
out of danger zone—with the Pres-Vac
Safety Feeder. Vacuum pick-up. Hand-
les flat pieces of various weights and
sizes. Trigger action. **Me- Request**
chanical Pickers available. **Bulletin**

F. J. LITTELL MACHINE CO.

4153 RAVENSWOOD AVE., CHICAGO 13, ILL.

At last!! A BALL BEARING FOR YOUR LINEAR MOTIONS



BALL BUSHINGS

Sliding linear motions are nearly always troublesome. Unlimited travel BALL BUSHINGS can be used to tremendous advantage on guide rods, guide posts, reciprocating shafts and for support of any mechanism that is moved or shifted in a straight line.

**LASTING PRECISION ALIGNMENT
ELIMINATE BINDING and CHATTER
ZERO SHAKE or PLAY
LOW FRICTION and WEAR
LONG LIFE — LOW MAINTENANCE
SOLVES SLIDING LUBRICATION PROBLEMS**

Now available for $\frac{1}{8}$ ", $\frac{1}{4}$ ", $\frac{3}{8}$ " and 1"
shaft diameters. Additional sizes to follow.

Write for literature and name of our representative in your city. No obligation, of course.

THOMSON INDUSTRIES, INC.

Dept. C., MANHASSET, N. Y.

PLANTS: Minnola, Long Island, Lancaster, Pa.

FRICTION COSTS MONEY

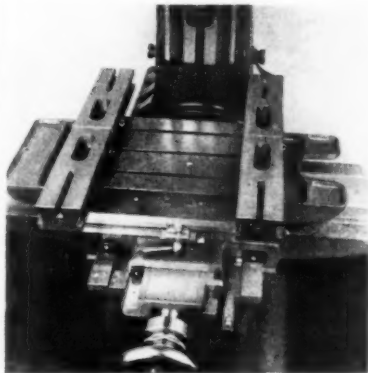
ROLL IT

DON'T SLIDE IT

EXTENSION PARALLELS INCREASE EFFECTIVE TABLE SIZE

Extension parallels, for use with Moore Jig Boreers and Jig Grinders to increase their effective table size, are announced by Moore Special Tool Co. Furnished in sets of four, they will accommodate work almost double the table size of the original unit without loss in accuracy of table settings. These parallels serve to widen the range of application of the only machine tools using precision lead screws to locate holes by the coordinate method.

By using extension parallels, the Moore Jig Grinder, and Models 1 and 2 Moore Jig Borer can accommodate work 5" larger than table size in both directions, or work 10" larger in one



direction. The illustration shows the parallels bolted to the table of a Moore Jig Borer, permitting the clamping into working position of a die more than twice the table size (10" x 19"). When extension parallels are applied, the 10" Rotary Table for circular parts, used with all three above units, can likewise be increased, to accommodate rings more than 20" in diameter.

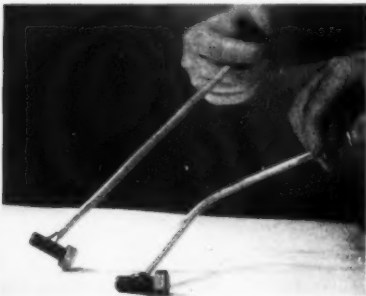
Extension parallels allow ample drill clearance, and T-slots are provided for clamping dies in place. Dimensions are: 2" in thickness; 3" in width; 10" in

length; material is close-grained Meehanite.

For complete information, write:
Moore Special Tool Co., Dept. BB
728 Union Ave.
Bridgeport 7, Conn.

USEFUL ACCESSORY FOR HARD-TO-REACH PLACES

The Flex-O-Pic, a specialty tool for inaccessible parts and places, has just been put on the market by Emco Enterprises. It is precision made, acid proof, cadmium plated, and can be disassembled for cleaning. The shaft is flexible cable encased in a flexible housing with expanding and retracting fingers which enable the tool to enter and grasp a tight hold, yet with enough flexibility to work around corners or S-turns.



Especially invented for tricky service jobs, Flex-O-Pic is a definite convenience around radio shops, autos, and battery shops. Manufacturers can solve safety problems, with its use because it reaches parts that are dangerously inaccessible. Complete information may be secured by writing:

Emco Enterprises, Dept. 118
6750 Stony Island Ave.
Chicago 49, Ill.

Total civilian employment in the United States reached a level of 61.5 million in the survey week of July 4-10, surpassing by 300,000 the record high established in June.

9 ways to speed production on tough jobs!



H-6, 1/2 H.P. multi-speed, Timken bearing countershaft, 825 to 3400 R.P.M.

Yes, production steps up and costs go down in a hurry—especially on time-consuming "tough" jobs—when you use any of the nine different Haskins Flexible Shaft Machines marked "heavy duty." For this equipment has all the direct- or countershaft-driven power needed for grinding rough welded joints, sanding large areas or doing heavy scratch brush work.

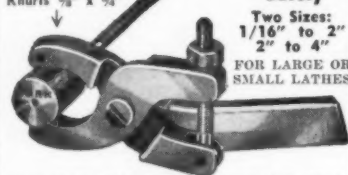
Powered by motors that range from 1/2 H.P. to 1 1/2 H.P., these continuous production machines also do a thorough job on precise work. Find out now about the complete line of Haskins equipment. Ask for your copy of Haskins Catalog on Heavy Duty Machines. R. G. Haskins Company, 2645 W. Harrison St., Chicago 12, Ill.



haskins
FLEXIBLE SHAFT EQUIPMENT

KNURL it Easily, Quickly, Safely

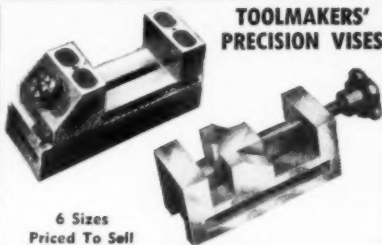
Use any Standard Knurls $\frac{3}{8}$ " x $\frac{3}{8}$ "



Two Sizes:
 $\frac{1}{16}$ " to 2"
2" to 4"
FOR LARGE OR SMALL LATHES

Joseph B. Fakes & Co., Royal Oak, Mich.

TOOLMAKERS' PRECISION VISES



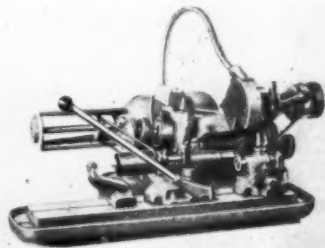
6 Sizes
Priced To Sell

HAUSER PIVOT POLISHING MACHINE FOR PRECISION INSTRUMENTS

A recently organized firm is the Hauser Machine Tool Corp., the direct sales representative for Henri Hauser Ltd., Biemme, Switzerland. This company manufactures special machinery, optical checking and measuring apparatus, and similar precision instruments. Illustrated is their Type 241 Pivot Polishing Machine, which is designed and built for the exacting requirements of the instrument, meter, clock and watch trades.

The unit is capable of polishing both hard and soft pivots. A tungsten carbide polishing wheel is used. The machine will polish hardened steel parts, giving a mirror-like finish, and will also impart an excellent finish to soft steel and brass parts. Shoulders and diameters may be polished in one operation. Tapers, angles, and radii all can be polished with equal ease. Polishing time varies between 3 and 45 seconds, according to the work diameter and the size reduction required.

The minimum diameter which can be polished is .004"; the maximum diameter, .197". The maximum length to be polished is 1.197"; maximum length of workpiece is 5".



For further information, write for 4-page illustrated bulletin to:
Hauser Machine Tool Corp., Dept. BB
74 Bournedale Road, North
Manhasset, N. Y.

SPHERICAL WASHERS



Carburized & Hardened—Blanchard ground.

Price per pair
 $\frac{1}{8}$ " hole \$1.25 ea.
 $\frac{3}{16}$ " hole 1.50 ea.
 $\frac{1}{4}$ " hole 1.85 ea.

Also $\frac{3}{8}$ " to $1\frac{1}{2}$ " hole at equally attractive prices. Quantity discounts. Send for parts catalog.

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WEST POINT MFG. CO.
19625 Merriman Ct.
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"MULTI-PURPOSE" VISE "ADJUST-ANGLE" KNURL HOLDER

SWIVEL-BASE VISE CENTERING VISE

Tools of Exceptional Usefulness
REQUEST BULLETIN NO. 44

GRAHAM MFG. CO.
55 Bridge St., East Greenwich, R. I.



STANDARD D-4 Abrasive Band Grinder

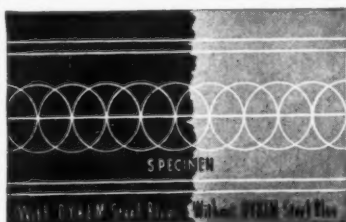
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for
Stamina

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre...at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

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MANUAL ON FINISHING—WRITE TODAY

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DYKEM STEEL BLUE STOPS LOSSES making dies & templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

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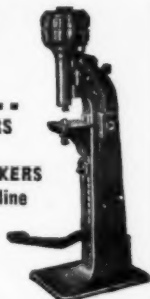
THE DYKEM COMPANY

2301G North 11th St., St. Louis, Mo.
In Canada: 2466 Dundas St. West, Toronto, Ont.

GRANT

RIVETERS...

PIONEERS
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THE GRANT MFG. & MACHINE CO.
C E Station, Bridgeport 5, Conn.

SAVE DOWN-TIME ON DIES

"Industrial" COMPENSATING SPACERS



For quick-easy adjustment on strippers, pressure pads, etc. Fit shoulder and standard screws. Precision made of hardened spring steel. Save making spacers, wire rings, shortening screws, etc.

PRICES per 100 f.o.b. CHICAGO

Size	ID	OD	Thickness 1/32"	1/16"
3/8	.750	1.000	\$1.52	\$1.95
1/2	.625	.875	1.43	1.75
5/8	.500	.750	1.08	1.35
3/4	.375	.562	.87	.95

600 Assorted and Indexed on 8" x 8" Metal Wall Rack **\$7.85**

PROMPT SHIPMENT
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INDUSTRIAL TOOL WORKS

1348 W. Henderson St. Chicago 13, U.S.A.



The "American Way"

**MACHINES TO BEND COLD PIPE, CONDUIT, BOILER TUBING
AND SOLID BAR . . . BENDING TABLES ALSO AVAILABLE**



Above: Hand powered Type A-30 . . . up to 180 bends . . . all sizes from $\frac{1}{2}$ " to 2". Only 7 parts. World's fastest, simplest machine. Note assortment of bending dies . . . this process makes shorter tangents than any other. Occupies only 18" by 18" floor space!

Other Sizes Available

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RADIANT HEAT BENDS

For residential work—at 6" and 9" radius bends on $\frac{1}{2}$ " and $\frac{3}{4}$ " pipe.

For industrial sizes — at 6" and 9" radius bends on 1" and $1\frac{1}{4}$ " pipe.

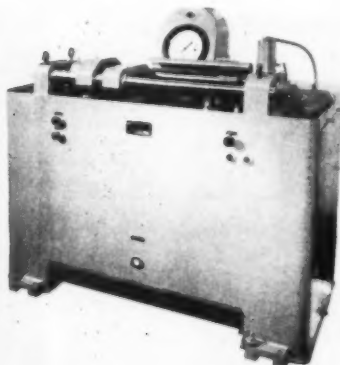
All the above bends and sizes are specified and accepted by most heating engineers and contractors.

Furnished as extras if required on our Type A-30.

"American"
PIPE BENDING MACHINE
Company INC.

HYDROSTATIC TESTING MACHINE FOR 20,000 P.S.I.

A Hydrostatic Testing Machine for pressures up to 20,000 pounds p.s.i. has



pressure testing of tubing of various lengths. The machine seals the end of the tubing without perceptible flare, eliminates air and builds up to the required pressure. For a predetermined time cycle it holds the pressure, then it automatically reverses and is ready for the next test. The pressure gauge can be disconnected during test. Peak test pressure is indicated by a red light on the panel. The time cycle for load and unload is approximately four seconds. The equipment consists of a hydraulic pump and motor, electrical timers and switches, solenoids, relays and valves. The unit is of one-piece steel fabricated construction, the electrical panel integral with the base. It occupies a floor area of 15 sq. ft. and an overall height of 5 ft. This machine may be also built for higher pressures. For details, write:

been designed and manufactured by
Steel City Testing Machines, Inc. for

Steel City Testing Machines, Inc.
8843 Livernois Ave., Dept. BB
Detroit 4, Mich.

STANDARD CARBIDE BLADES . . . For All Types of Milling Cutter Bodies

Check These Advantages:

Carbon Tool Steel Shank

Lower Cost
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Oversize Tip-Diamond Lapped Flush
With Top of Shank

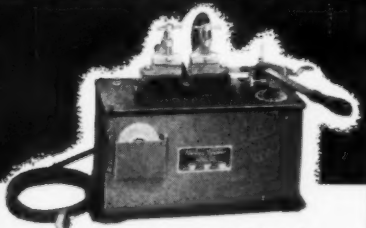
10° Relief Angles
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Blade Number and Grade Visible
After Blade Is Assembled in Body

We Fabricate All Types of Carbide Tools. Write for Bulletin No. 101
or Send Print or Sample for Quotation. Distributor Inquiries Invited.

WISCONSIN CARBIDE TOOL CO., 3343 N. 35th St., Milwaukee 10, Wis.

Weldex Bandsaw Welder



Flash welds blades up to $\frac{3}{4}$ ". Ideal for
intermittent wire butt welding applica-
tions. Eliminates joint preparation and
"special flux". Instantly burns off
surface irregularities.

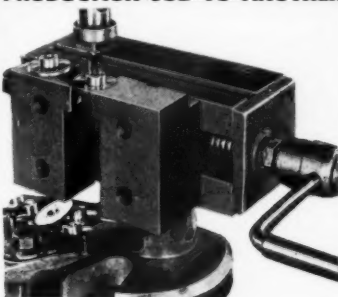
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and 220 volt models. For details write

Weldex Int.

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NEEDED TO CHANGE FROM ONE
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UNIVERSAL DIAL TEST INDICATOR SETS

NEW — SURPLUS



- Complete Set of Dial & 8 Attachments.
- Dial Reading $\pm .001$ and $-.001$
- Packed in Wooden Box—grooved to hold each attachment.

Regular Price—\$23.00

OUR PRICE — \$15.00

VETERAN TOOL & SUPPLY CO. 88 Baxter St., N. Y. 13, N. Y.

SELF-WINDING REEL FOR PRODUCTION LINE USE

A self-winding reel that suspends portable tools for use on the production line, and raises them out of the way when not needed, is a recent addition to the products made by Aero-Motive Manufacturing Co. Known as the Zoo "Self-Winding" Balance Reel, the device speeds production and reduces fatigue by keeping such tools as power screw drivers, nut runners and drills always within instant reach of the worker. It helps eliminate accidental dropping and other rough handling of tools.

The reel is suspended from a beam or a cable in work position above the operator. The power tool is fastened to the end of a 6 ft. cable wound on a drum within the housing. The operator simply pulls the tool down for use when he needs it, raises it out of the way when he has finished the job.

The reel tension is easily regulated to balance any tool weighing up to 10 lbs. Tension nut and lock are located on the same side of the reel housing for quick adjustment. The reel is mounted within a cast aluminum alloy housing. Oilless bearings eliminate maintenance. The cable outlet is located at the side of the housing, so that the



cable leaves and enters in a straight line, minimizing strain and wear.

Literature is available upon request.

**Aero-Motive Mfg. Co., Dept. BB
1803 Alcott St.
Kalamazoo 24, Mich.**



TRICO OILERS

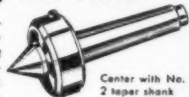
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- END BEARING FAILURES
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Many styles & sizes
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Ball Bearing Live Center

Designed for maximum strength and rigidity, the Ball Bearing Live Center is recommended for high speeds, heavy roughing cuts, etc. 60 degree point runs in substantial precision ball bearing which is easily replaceable.



Center with No. 2 taper shank \$13.75

With No. 3 shank \$16.25

f.o.b. factory

SOUTH BEND LATHES WORKS
425A E. Madison St.
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A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



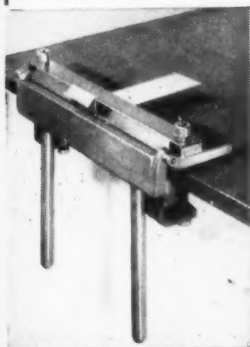
The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in $\frac{3}{16}$ " to 1" diameters. Send for pricelist.

HEIMANN MFG. CO.

332 Lincoln Ave.

Urbana, Ohio

10" Portable METAL BRAKE



only
\$10.00
F.O.B.
Detroit
No CODs
Immediate
Delivery
While
Supply
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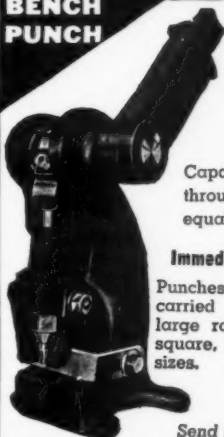
Maximum capacity 22 gauge 10" wide. Well balanced, easily operated, sturdy construction. Literature on other styles, capacities and sizes up to 24" available upon request. Dealers invited.

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FRONT LEVER BENCH PUNCH



**STURDY
•
DURABLE
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HANDY**

Capacity: $\frac{7}{16}$ " hole through $\frac{1}{4}$ " steel or equal.

Immediate shipment.

Punches and dies are carried in stock in a large range of round, square, flat, and oval sizes.

Send for Circular.

T. H. LEWTHWAITE MACHINE CO.

311 East 47th St.

New York 17, N. Y.



Save time . . . Money . . . Instant stock check-up "INDUSTRIAL" DRILL ROD RACKS

Pick sizes and lengths instantly. Save waste. Fast selection of long or short pieces. Fully indexed in Numbers, Fractions and Decimals. Durable all steel V-slot construction.

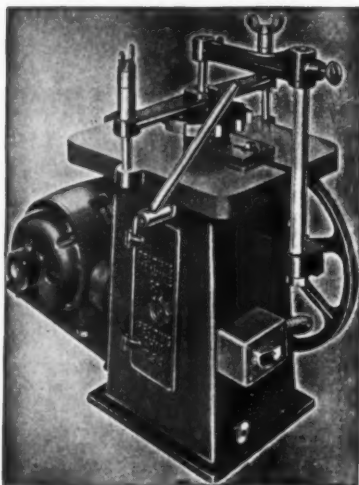
NUMBER SIZE — Holds 8 to 10 each of Rods from 1 thru 60, and 3" to 36" lengths 54" Long x 30" High. **\$25.00**
F.O.B. Chicago.

FRACTIONAL SIZE — Holds 5 to 10 each of rods $\frac{1}{32}$ " thru $\frac{17}{32}$ " by 64ths. Fractional and Decimal index. 46" Long x 30" High. **\$23.00**
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INDUSTRIAL TOOL WORKS, 1348 W. Henderson St., Chicago 13**

NO BUSHINGS, GUIDES or PILOTS NEEDED

THE READING BROACH KEYSEATER



The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from $\frac{1}{8}$ to $\frac{3}{8}$ cutter. Prompt delivery—low first cost.

READING MACHINE CO.
READING (CINCINNATI) OHIO

NEW TOOL FOR CLOSE-QUARTER WORK

The Bonney Forge and Tool Works has announced a new tool called the Wobble Drive Extension, which is designed for work in close quarters. This unusual device enables a mechanic to obtain a small amount of swivel and to work on a bolt or nut with the extension leaning at an angle of approximately 12° in any direction without the use of a universal joint.



The male end is a $\frac{3}{8}$ " wobble drive which will receive any $\frac{3}{8}$ " drive socket. The other end is a female $\frac{3}{8}$ " square drive for attaching a ratchet, hinge handle, speeder or "T" handle. The tool is available in two sizes: No. AT4, 6" long, and No. AT5, 12" long. For further particulars, write:

Bonney Forge & Tool Works
Dept. BB
Allentown, Pa.

ALUMINUM INDUSTRIAL WHEELS

A new line of cast aluminum industrial wheels has been introduced by the Pikes Peak Aluminum Foundry, Inc. The wheels feature split-type construction, and are cast in permanent molds from new ingot. Seven standard models which are being made available are for 6 x 2.00, 8 x 2.50, 10 x 2.50 or 10 x 2.75, 12 x 3.00, 16 x 4.00 and 4.00 x 8 zero-pressure, solid rubber and pneumatic industrial tires.

The wheels can be furnished with bearings, or machined to special bearing specifications, and they are available with or without tires. Literature giving complete information and specifications is available from:

Pikes Peak Aluminum Foundry, Inc.
P.O. Box 401 — Dept. BB
Colorado Springs, Colo.

**NEW ALL-STEEL PRESS BRAKE FOR
LIGHT BENDING OPERATIONS**

The new Model No. 131 Chicago Steel Press Brake has recently been introduced by Dreis & Krump Manufacturing Co., Chicago manufacturers of sheet metal working machinery. This new machine supplements the larger units for all operations within its rated capacity of eleven tons. Both large industries and small shops will find this speedy, accurate press a useful addition in the manufacture of light sheet metal parts and products.



A smooth operating friction clutch and variable speed drive of from 25 to 60 strokes per minute are useful additions to the operator's skill. All-steel construction and enclosed gearing are provided. The unit has a working length of 48"; the die space above the lower die holder is 6"; space above the bed is 7 $\frac{1}{4}$ ". The brake is provided with a 2" stroke.

The Press Brake is powered by a $\frac{1}{2}$ h.p., two or three-phase, 50 or 60 cycle, 220/440 volt, 1800 r.p.m. motor. Exact current requirements must be specified. For complete specifications and operating data on this new unit, write:

**Dreis & Krump Mfg. Co., Dept. BB
74th St. and Loomis Blvd.
Chicago 36, Ill.**

Quick Acting
**JOHNSON
FURNACES**

**CUT HEAT - TREATING COSTS
SAVE TIME WITH JOHNSON**

**No. 120
Hi - Speed**

**1500° F. in
5 Minutes**

**2300° F. in
30 Minutes**

\$145.50

F.O.B. Factory



A fast, versatile unit for toolroom and shop. Hardens any steels. Gets the job done quickly to save time and gas. Compact, powerful, and remarkably economical to operate. Easily regulated. Firebox 5 x 7 $\frac{1}{4}$ x 13 $\frac{1}{2}$. Complete with Carbofrax Hearth, G.E. Motor, and Johnson Blower.

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JOHNSON GAS APPLIANCE CO.

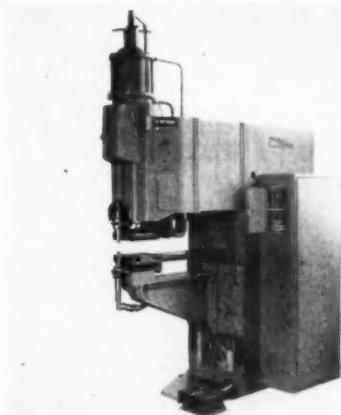
570 E Ave. N. W., Cedar Rapids, Iowa

TRI-PHASE WELDERS CORRECT POWER SUPPLY DIFFICULTIES

Taylor-Winfield Corp. is now in production on Tri-Phase welders which feature three phase balanced power, giving a desirable high power factor (95%) at greatly reduced power demand. This new unit attains advantages which are desirable in resistance welding. Higher production and improved quality of welds can now be obtained with existing power installations.

Reduced electrode wear and pickup are claimed for Tri-Phase. Closer spot spacing and less sensitivity to work thicknesses are additional advantages. The Tri-Phase welding circuit permits a greater range of shapes and sizes of work to be welded, especially in deep-throated welders. Welding currents are essentially constant when magnetic work or fixtures are moved into the work area, or when work clearances vary.

The new welder will produce high quality welds in low carbon steel, stainless steel, aluminum and magnesium alloys, monel, inconel, brass alloys and many other weldable materials. The unit may be had in spot, seam, projection, and upset-butt welders. For com-



plete information on the Tri-Phase, write:

Taylor-Winfield Corp., Dept. BB
1050 Mahoning Ave.
Warren, Ohio.

SEALANT SALVAGES REJECTED POROUS METAL CASTINGS

A new chemical sealant now available is economically salvaging approximately 99 percent of castings rejected due to porosity. Leakage in these castings, designed to be pressure tight,



has been eliminated by impregnation under vacuum and air pressure.

It can be applied with equal success to castings of bronze, steel and grey

iron. Its application is clean and surfaces, ducts, pockets or machined areas show no visible sign of the treatment.

It is claimed the sealant is able to insure pressure tightness usually with only one impregnation and will not "bleed out" in curing, and is chemically unaffected by hydrocarbons, other petroleum products or glycols. Water, solvents, salts and moderate acids or alkalis have little or no effect. This thermosetting co-polymer has a heat resistance of many times the normal operational requirements of the casting. The viscosity of this new resin can be controlled to meet a wide range of requirements and insure proper flow into all pores of the casting. Write to:

Western Sealant Co., Dept. BB
9093 W. Washington Blvd.
Culver City, Cal.

ALMOND DRILL CHUCKS



Maximum gripping power with extreme accuracy and long life.

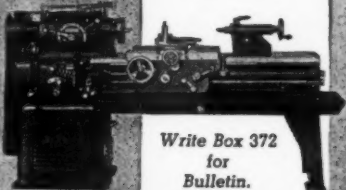
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T. R. ALMOND MFG. CO.
ASHBURNHAM, MASS.
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CARROLL AND JAMIESON LATHES 15" AND 16"

12 Speed Geared
Head Motor Drive
Timken Mounted
Spindle

Modern Design—
Liberal
Dimensions



*Write Box 372
for
Bulletin.*

**THE CARROLL & JAMIESON
MACHINE TOOL CO.**

BATAVIA OHIO U. S. A.

COMET TOOLS

Facing

**BORING, FACING &
INTERNAL THREADING**

Boring

Int. Threading

For holes from $\frac{1}{4}$ "
upward, 15 different
sizes.

Made of Super-High-Speed Steel Specially Heat Treated
Indispensable for your JIG BORER. The worm-
like spiral of the boring heads provides a long,
useful cutting surface. Their use insures perfect
fitting threads. Correctly designed for precision
work.

Write for Complete Data

COMET TOOL CO.

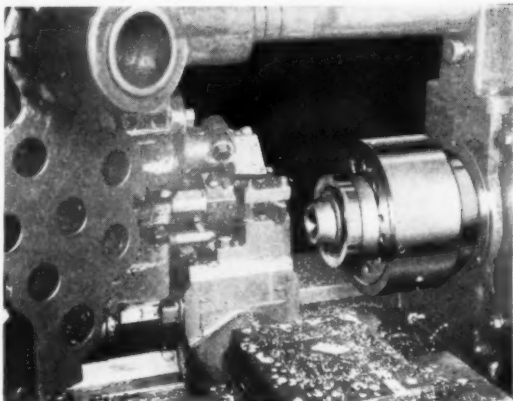
738 Broadway

New York 3, N. Y.

THE SPEEDGRIP UNIVERSAL INTERNAL CHUCKER

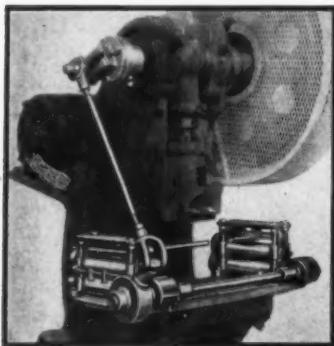
The Speedgrip Chuck was designed primarily for second operation chucking of parts where the bore and one face have been previously machined true with each other. These devices are used extensively on Turret Lathes, Automatic Chucking Machines, Engine Lathes, and Multiple Spindle Boring Machines. They may also be used to advantage on Grinders, Milling Machines, Gear Shapers and Hobbers, Jig Borers, etc.

The chucks are manufactured in six sizes, and will accommodate work parts with bores ranging from $\frac{1}{2}$ " to 11" in diameter. The major component parts of the Chuck consist of a semi-steel spindle



adapter, a hardened and ground nose plate, expansible bushing, and a hardened draw screw.

Increase the efficiency of your punch presses with Automatic Roll Feeds



- Easily attached to any press.
- Completely automatic in operation.
- Presses produce 100% of operating time.
- Precision built for consistent and accurate feeding and long life.
- Simple design — easy to maintain.

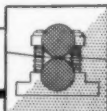
Standard models from 3" to 12" wide with up to 18" advance in both single and double feed models. Larger feeds and longer advances can be made to your specifications.

We also manufacture a complete line of Stock Reels, Stock Straighteners, Wire Straighteners and Scrap Cutters.

Write to-day for literature and quotation forms.
La Bahn Machinery and Mfg. Company,
542 Lincoln Highway, Menlo Park, N. J.

LA BAHN

ROLL FEEDS • STOCK REELS



MACHINE & MFG. CO.

METUCHEN • NEW JERSEY

STOCK STRAIGHTENERS • SCRAP CUTTERS

The Chuck can be actuated by means of an air cylinder, drawback or pushout collet mechanism, or manually.

Speedgrip Chucks are precision built, and will produce parts that are parallel and concentric within .0002". There are no parts that can become worn, to produce an eccentric or out-of-parallel. Changing from one job to another requires only the changing from one size expandable bushing to another, and in some instances from one parallel work spacing ring to another, in a few minutes time. Four screws in the o.d. of the spindle adapter make it possible to adjust the nose plate with extreme accuracy, after which the chuck can be removed from the spindle and replaced many times without readjusting.

Parts may be chucked lightly, or with tremendous pressure, depending upon the nature of the work. Thin walled parts can be machined without distortion. As the expandable bushing is drawn back over the tapered nose, it not only expands to grip the bore of the work but at the same time draws the work back to an accurate stop which in-

sures the two faces being parallel. Sufficient pressure is exerted by the expandable bushing alone to direct most work, but in addition to this, a powerful drive is produced by the pressure of the work against the face of the nose plate, work spacing parallels, or rings. Write for 4-page illustrated bulletin.

Speedgrip Chuck, Inc. Dept. BB
1100 W. Beardsley Ave.
Elkhart, Indiana

K-O PORTABLE ELECTRIC DRILLS EQUIPPED WITH K-O KEYLESS DRILL CHUCKS

A new line of eight portable electric drills, all equipped with K-O Keyless Drill Chucks, including models from a 1/4" lightweight, streamlined drill to a heavy duty 7/8" unit, has just been announced by the K. O. Lee Co. The manufacturer reports that the increasing demand for a quality portable drill with the K-O keyless chuck as original equipment was the deciding factor in their decision to add these tools to their "Knock-Out" line.

"The STANDARD of COMPARISON for QUALITY and ACCURACY"



- QUALITY
- SERVICE

IMMEDIATE DELIVERY!



AMERICAN DRILL JIG BUSHINGS



Precision made from finest oil hardened tool steel — ASA Standard — featuring concentric ground lead to insure perfect alignment. Complete stocks maintained at all times by exclusive distributors throughout the U. S. and Canada, for immediate free delivery.

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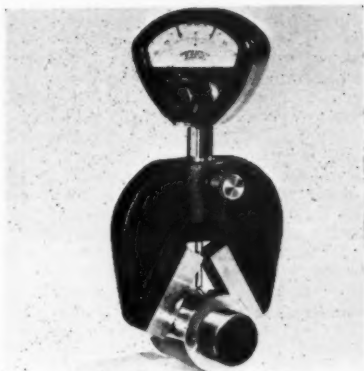
American Drill Bushing
CO., INC.

1110 So. Santa Fe Avenue, Los Angeles 21, Calif.
SPECIALIZING ONLY IN DRILL BUSHINGS

THE RIDER MIKROKATOR FOR DETERMINING OUTSIDE MEASUREMENTS

The Rider Mikrokator is a precision measuring instrument recently introduced by the Swedish Gage Company of America. This ingenious device is intended for checking out-of-roundness and diameters of cylindrical parts. Since the measurements are carried out according to the three-point principle, the instrument can be used to good advantage for checking centerless-ground pieces.

The frames are made of malleable cast iron with enamel finish. They are provided with hardened, ground and lapped anvils and insulating grips. The measuring surfaces of the anvils can be tipped with cemented carbide. As the angle between the anvils is 60°, the difference in radius between the setting gage and the work is measured, and the tolerance pointers of the Mikrokator should therefore be positioned only to half the limits required. For complete details and specifications on

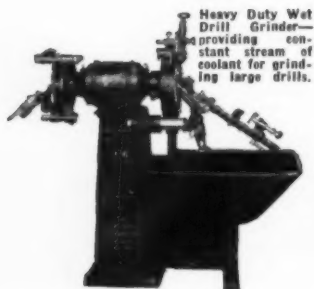


this instrument, write:
Swedish Gage Co. of America
8900 Alpine Ave., Dept. BB
Detroit 4, Mich.

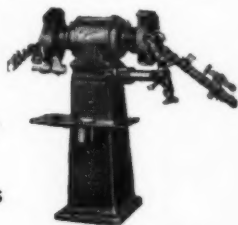
GET THE POINT?

GET IT FAST...GET IT RIGHT

with **Hisey** Drill Grinders



Heavy Duty Wet Drill Grinder—providing constant stream of coolant for grinding large drills.



Heavy Duty Drill Grinder—a compact unit for tool room or shop.

THE importance of a correctly-ground drill point cannot be over-emphasized. With "Hisey" Heavy Duty Drill Grinders, even unskilled workers get a perfect point every time, in minimum time.

From No. 60 to 2½" drills on one machine without clamping or chucking. Drills up to ¾" are ground on the left hand wheel . . . 59° angle at point and 12° clearance angle without adjustment. The larger holder grinds points varying from 37° to 70°, with clearance angle as required. And these Hisey-ground perfect points mean your drills last longer, drill more holes per grind with far less breakage and drill holes true to size. Write for Catalog 70 AU, showing many other styles and sizes.

The Hisey-Wolf Machine Co.
DIVISION OF SMITH & MILLS CO.
Cincinnati 25, Ohio

Producers of SCREW MACHINE PRODUCTS to specifications.

We know our equipment.

Can we assist in designing your screw machine products for adaptation to our equipment?

Automatics—2½" Rd. capacity, Turret Lathes—3" Rd. capacity. Castings & Forgings machined to a maximum diameter of 10", length 8", weight 15 lbs.

We are also equipped for Milling, Drilling, Threading & Tapping. May we quote?

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Pittsburgh 1, Pa.

★ THE ★ WONDER CUTTER

The lowest-priced wire and rod cutter on the market. The hardened cutters last indefinitely.

Hand operated. A giant for work, cuts wire and rods up to ¾-in. round or ¾-in. square and band iron up to ½ in. by 2-in. Adjustable stop for repeated cuts to same length. Large or small, your shop can use a WONDER CUTTER.

Write today for prices.

THE FEDERAL FOUNDRY SUPPLY CO.

4602 East 71st St.,

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DIE CUSHIONS

Size and design for any of your punch press requirements.

Get your work problems analyzed by our die cushion engineers.

DAYTON ROGERS MFG. CO.

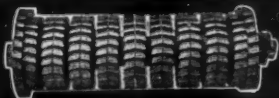
Minneapolis 7, Minnesota

CUT YOUR COSTS! (THE EASY WAY)

Send your cutting tools in today for Sharpening, Salvaging, Reconditioning.

SAVE UP TO 70%

Rutland
13006 GREELEY



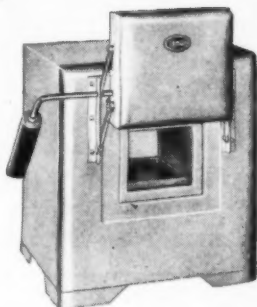
TOOL SERVICE
DETROIT 3, MICH.

TEMCO ELECTRIC FURNACES

Thermo Electric Manufacturing Co. announces a new line of bench-type Temco Electric Furnaces for laboratory uses and for heat treating of carbon and high chrome steel parts.

The new models are designed in six sizes, ranging in chamber dimensions from 4" wide, 3½" high, and 4½" deep to 8½" wide, 7-1/2" high, and 18" deep. The furnaces are fast heating and may be operated up to 1650°F for continuous use and to 1900°F for short periods. Heavy gauge highest quality nickel-chromium heating elements used in these new furnaces have a very low ratio of watts p.s.i. of heating surface which assures long life. The elements are embedded in refractory plates which form the sides, top and bottom of the heating chamber, which protects them from physical damage, minimizes oxidation and provides even distribution of heat.

All models have uplifting counter-balanced doors except the two largest sizes in which the door is divided horizontally into two sections permitting the bottom half to be lowered separately and allowing access to the chamber with minimum loss of heat. Furnace bodies are of welded steel construction



with dual insulation 3" thick in the smaller sizes to 6" thick in the larger units.

Four sizes are available for operation on either 115 or 230 V., 50/60 cycles. The two larger sizes are for 230 V. only. Specifications and prices may be had upon request.

**Thermo Electric Mfg. Co., Dept. BB
Dubuque, Iowa**

MOORE
SET SCREWS

Spotlight Progressive Industry



GEORGE W. MOORE, Inc.
100 BEAVER ST. WALTHAM, MASS.



Illustration 1/5 actual size

CRATEX
Assortment No. 774
44 Wheels and Points

In various grits and standard sizes for cleaning and polishing, plus three mandrels.

**ALL
FOR
\$250**

CRATEX MANUFACTURING CO.
86 Natoma St. San Francisco, Calif.



CLOSED
TRADE



AUTOM

CLOSED
MARK



Plain Type

Offset Type

CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

THREE-FOURTHS OFFSET.



AUTO MOULDING & MFG. CO.

1110 E. 87TH ST.
CHICAGO 19, ILL.

SEMI-OFFSET



SPECIFICATIONS:
 Open Width $\frac{1}{8}$ " to 6"
 Gage Material .040 to .125
 Pin Diameter .101 to $\frac{1}{8}$ "
 Lengths to 120"

*Tapered Keyways
Keyways in Tapered Holes
Multiple Keyways in Same Bore*

with a
STANDARD GLENNY
Adjustable Expansion **PUSH BROACH**



Recognized everywhere as the most efficient, safe and economical tool for keyway cutting—the Glenny now reaches out to perform many new, time and money saving operations through four ingenious, inexpensive types of bushings, announced in Bulletin No. 11.

THE GLENNY IS KNOWN FOR OFTEN REDUCING KEYWAYS COSTS AS MUCH AS TEN TIMES. YOUR GLENNY NOW PROVIDES EVEN GREATER SAVINGS.

SEND FOR BULLETIN

DEPT.
10

The EAST SHORE MACHINE PRODUCTS CO.

835 EAST 140th STREET • CLEVELAND 10, OHIO

LOW COST LOCATING BY CENTER SCOPE

Dependable Accuracy.

Ample Adjustment
 For Spindle Run-Out.
 For Drill Presses, Lathes, Mills.

•


SERIES "M"
\$24.50
 CASE EXTRA **\$3.50**



Bulletin M-8
CENTER SCOPE PRODUCTS
 3829 San Fernando Rd., Glendale 4, Calif.


USE ECONOMY

— DERIVE ECONOMY




**SOCKET HEAD
CAP SCREWS**

**MILLED
FROM BAR**



**ECONOMY
PRODUCTS**

**HOLLOW
SET SCREWS**



**MADE OF
ALLOY STEEL**

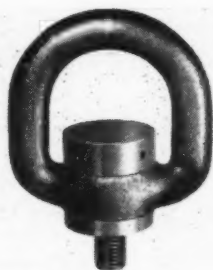
ECONOMY MACHINE PROD. CO., 5207 Lawrence Ave., Chicago 30, Ill.

MODERN SELF-ALIGNING DIE LIFTERS

A line of Self-Aligning Die Lifters for the safe and convenient handling of dies, machine tools and other heavy objects is announced by Modern Collet & Machine Co.

These new units consist of a swiveling eye, which accommodates standard lifting hooks, and a stud assembly at the bottom, which turns as a unit for attaching and removing the device. The stud is quickly clamped at the proper depth by turning the round nut inside the eye until the collar at the bottom seats against the object to be lifted. Since the eye swivels freely at all times, the stud cannot work loose.

These Die Lifters are available in four sizes, with maximum lifting capacities of 16, 28, 40 and 100 tons each. Studs are of $\frac{3}{4}$ ", 1", $1\frac{1}{4}$ " and $1\frac{1}{2}$ " diameter respectively and have U. S. Standard threads. For maximum strength and safety, all parts are made of heat-treated alloy steel of over 180,000 p.s.i. tensile strength, and the swiveling eye lines up with the pull



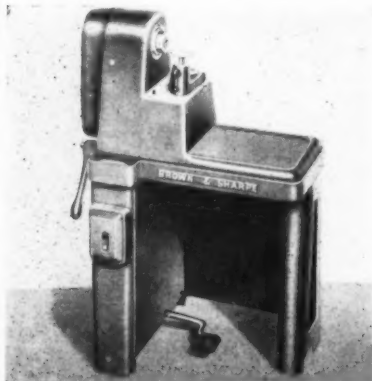
to eliminate twisting stress.

An illustrated bulletin giving specifications, prices and construction details is available on request:

Modern Collet & Machine Co.
401 Salliotte St., Dept. BB
Ecorse 18, Mich.

B & S POLISHING AND FINISHING MACHINE

This recent addition to the Brown & Sharpe line of machine tools is advantageous for general use where polishing, filing, burring, and similar operations are required on small parts.



It is useful for hand tooling, polishing screw heads, removing cut-off ears, and burring operations necessary in con-

nection with parts produced on automatic screw machines. The unit is a useful addition to any automatic screw machine department, since work can be performed at rapid production rates.

The convenient height permits the operator to either sit or stand at his work. Three spindle speeds are provided, of 4500, 3280, and 2380 r.p.m., driven by a v-belt from a $\frac{1}{2}$ h.p. motor. The control of the collet and brake by a foot pedal provides for the simultaneous opening of the collet and stopping of the spindle, leaving both hands free to load, perform necessary operations, and remove the work. The outside of the work spindle is threaded to take a small chuck or other fixtures as required.

Collets can be furnished to take stock from $\frac{1}{8}$ " to 1" diameter. The machine will swing $9\frac{3}{4}$ " diameter over bed, and $7\frac{3}{4}$ " diameter over the tool rest. The floor space required by the machine is $19\frac{1}{2}$ " at right-angles to the spindle; parallel to the spindle, $29\frac{1}{2}$ ".

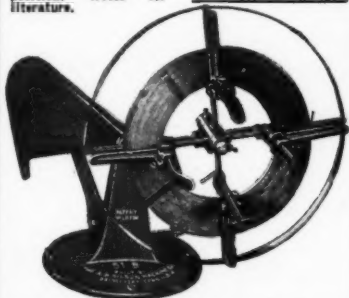
For complete details and specifications, write for Sheet X4-48.

Brown & Sharpe Mfg. Co., Dept. BB
Providence 1, R. I.

NILSON

Reel is loaded by one man in less than one minute. . . . Automatic balancer eliminates hand lifting . . . avoids strains and accidents. Locking device automatically locks reel in position. Write for literature.

WIRE AND RIBBON STOCK REELS ★



THE A. H. NILSON MACHINE CO.
BRIDGEPORT, CONN., U. S. A.

INCREASE YOUR PROFITS WITH A HIGH SPEED



COLD RIVETING HAMMER

GET A FREE
ANALYSIS OF
YOUR RIVETING
PROBLEM . . .
WRITE TODAY!

The High Speed Hammer Co., Inc.
311 Norton St. Rochester 5, N. Y.

PRODUCTION STANDS OUT WHEN PROTECTION IS BUILT IN!

With Junkin Safety Guards on the Job, EVERY MINUTE is devoted to production—because costly, time-consuming accidents are eliminated.

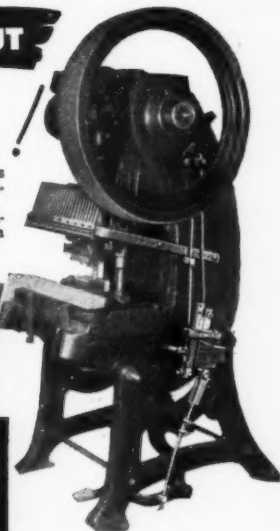
You reap the important benefit of improved worker efficiency too, for with this ever present evidence of protection press operators are able to hit new peaks of efficiency.

Send for bulletins describing the Junkin Safety Guard and Swinging Die Closure. Address:

**JUNKIN SAFETY
APPLIANCE CO., INC.**
936 W. Hill Street,
Louisville, Ky.

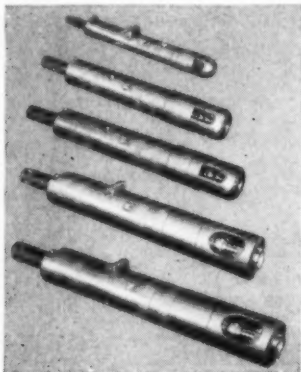


JUNKIN SAFETY GUARD



AIRFEEDRILL UNITS FOR MULTIPLE DRILLING

Keller Tool Co. manufactures a new line of Airfeedrill Units which offer a modern approach to the multiple drilling problem. The line consists of



five major units, as illustrated, embracing 34 speed combinations of stationary and portable units for drilling holes up to $\frac{3}{4}$ " diameter in mild steel, aluminum, brass, or plastics. The tools are light, ranging from $3\frac{1}{2}$ to 28 lbs. in weight.

The Airfeedrill is a combination of a Keller air drill, an air cylinder, and a hydraulic dashpot and feed control assembled in one housing, and arranged for quick locking in a jig, or permanently in a fixture. Intricate jigs on heavy metal bases are not required, resulting in considerable saving of time and expense in tooling up.

A folder is offered which contains complete specifications and dimensions of the bushings and fittings available with portable and stationary drills. Write:

Keller Tool Co., Dept. BB
Grand Haven, Mich.

120-INCH TELESCOPIC WORKSAVER

A new 120-inch telescopic Worksaver has just been announced by the Materials Handling Division of The Yale & Towne Mfg. Co. The new tilting

fork model—the highest-lifting "walkie" available — has a capacity of 3000 lbs. and was specially designed to make possible maximum use of available headroom in high-stacking operations. Such an unusually high reach (120") combined with such a low lowered clearance (83") is accomplished by means of a ram-within-a-ram. When an outer hydraulic piston has fully extended upward, an inner one begins to extend downward, doubling the lift available.

The truck travels at 2 miles per hour under full load, lifts 8 ft. per minute with 2500 lb. load, and tilts a full 18 degrees in 10 seconds. Total weight of the truck, including a 19 plate battery, is 3,640 lb. Though battery powered in every respect, it is guided by a walking operator.

Worksaver dimensions — 33 inches wide by 64 inches long. Write:

Yale & Towne Mfg. Co.
4530 Tacony St., Dept. BB.
Philadelphia 24, Pa.

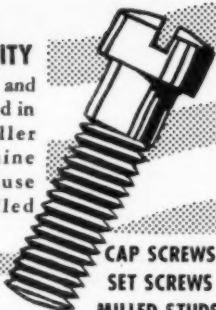
PORTABLE SHEET METAL BRAKES

New Webco Portable Sheet Metal Brakes, featuring detachable open end bars and adjustable finger assemblies, are now being manufactured by Webb Machine & Tool Co., Coraopolis, Penna. The new Webco with improved hinges and redesigned folding arms, bend sheets (steel, aluminum, copper, or lead) up to 18 gauge, depending on brake model and folding arm used. Clamping bar operates with flip of finger tip, adjusts automatically for all gauges. On Model W-48, open end bar has 37" working width face; 12 $\frac{1}{4}$ " width each end of bar. On Model W-30, open end bar has 27" working width, face; 8 $\frac{1}{4}$ " width each end of bar. Sliding folding fingers are available in seven sizes. Standard bars have working widths of 31" or 49", depending on model. Folding bars can be removed for bends impossible to make on fixed bars. Stands are detachable, permitting entire unit to be carried in back of car or pick-up truck.

Further information is available from:
Webb Machine & Tool Co.
Dept. BB, Coraopolis, Pa.

CONCENTRICITY

of head, body and thread is assured in every Ottemiller Screw Machine Product because they're "milled from the bar."



CAP SCREWS
SET SCREWS
MILLED STUDS
COUPLING
BOLTS

PRECISION MILLED by

WILLIAM H. CO
Ottemiller

York, Pennsylvania

DISTRIBUTORS IN PRINCIPAL CITIES

BURR KEYSEATERS



Mill keyways in the run or on the ends of shafting already erected—save money on alteration, erection, and repair work.

Made in 4 sizes, for hand or motor operation.

Write for Bulletin and prices.

JOHN T. BURR & SON

429 Kent Ave.,

Brooklyn, N. Y.

Quality Lathe Dogs



STANDARD

SAFETY

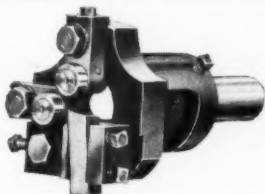
Capacity	Price*	Capacity	Price**
1/2"	\$9.00	3/8"	\$9.75
3/4"	1.00	1/2"	.80
1"	1.10	3/4"	.95
1-1/8"	1.25	1"	1.05
1-1/2"	1.50	1-1/4"	1.15
1-3/4"	1.85	1-1/2"	1.45
2"	1.80	* 13-inch or larger lathe.	
2-1/2"	2.00	** 8-inch and 10-inch lathe.	
3"	2.30		
3-1/2"	3.15		
4"	4.25		

f.o.b. factory

SOUTH BEND LATHE WORKS

428A E. Madison St.
South Bend 22, Indiana

WATSON Tangent Cut Box Tool



A general purpose, tangent cut, roller rest box tool of wide range for turning diameters from bar stock castings, forgings or other material. Applicable to all sorts of screw, turret and other machines, hand or automatic. It is simple to set and eliminates resetting when it is necessary to grind the bit. Write for descriptive folder giving complete information.

The Watson Mfg. Co.

2220 ALBION ST.

TOLEDO 6, OHIO

CAMS

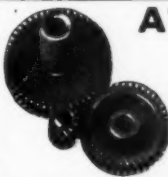
Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

Let us have your inquiries.

BLOOMFIELD TOOL CORP.

36 Farrand St.

Bloomfield, N. J.



ATLANTIC for GEARS

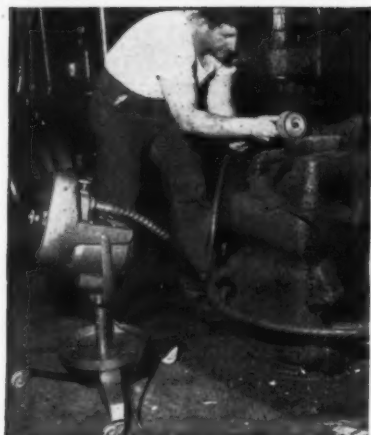
Our service on small gears, due to new equipment recently installed, will interest you.

Send samples or blueprints for quotation.

ATLANTIC GEAR WORKS, INC.

198 Lafayette St., N. Y. 12, N. Y. Canal 4-1441

AVOID PRODUCTION DELAYS with . . .



STOW

Streamlined

Keeping set-ups intact by regrounding worn dies right on the press is just **one** of the many ways customers are using the **NEW STOW Streamliner** to speed-up production and cut costs.

FLEXIBLE SHAFT MACHINES

Take the tool to the job and you, too, save time and money. **STOW Flexible Shaft Machines** go everywhere in the shop—they are available in portable high or low pedestal, suspension or bench mountings . . . with a wide range of power and speed ratings. They'll do almost everything—grind, file, drill, sand, wire brush, buff or polish . . . in hard-to-get-at places and around obstructions.

See the improved **STOW Streamlined Flexible Shaft Machines** at your mill supplies dealer—or write today for full details.

Only **STOW** has all these features:

1. Genuine **STOW Flexible Shaft**
2. Ball bearing motor and hand-piece.
3. Instantly regulated V-belt dr.
4. Free-swinging pivot mounting.

STOW

MANUFACTURING CO.
30 Shear St., Binghamton, N. Y.

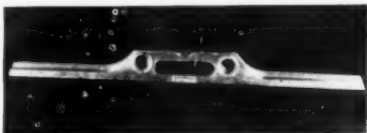
KEWANEE LIGHTWEIGHT ACCURATE LEVELS

A new, attractive design in spirit levels, offering several advantages is announced by the Kewanee Private Utilities Co.

The design reduces weight since all levels are made of rustless alloy, and provides a balanced tool for easy handling. Accuracy in setting the vials is stressed, and with a single vial, absolute level from either end of the tool is obtained, which is not always possible with double vial instruments. The top sight of the horizontal level is standard on all sizes, eliminating stooping required to view the ordinary side sight.

A low center of gravity resists up-setting, and the design and finger grip permit picking up the tool for instant use regardless of the position in which it might lie. The levels range from 4½" to 24" with level, plumb and mitre vials in larger sizes.

Specialty models include a circular vial instrument giving absolute level as well as slope in any direction. This



tool is especially useful in setting up work. A grade level registers the pitch for pipe, tile, and floors and has a range of ¼ inch to 5½ inches slope in 10 feet.

Literature is available from the manufacturers on request.

Kewanee Private Utilities Co.
Dept. BB
Kewanee, Ill.

Shipments of aluminum wrought products in June 1948 increased to 142 million pounds, a rise of 6% over the 133 million pounds shipped in May. The June 1948 shipments were 54% higher than those for the same month in 1947, when only 92 million pounds were shipped.

HOOK-'N-HAUL TRUCK USEFUL MATERIALS HANDLING DEVICE

Teichtmann Industries have recently developed a versatile new item in the materials handling field, the "Hook-'N-Haul" Truck. The double hook feature enables the hook-arm to bite into totally closed wood boxes or cases, or into open boxes; the upper hook clutches handles on metal tote boxes, etc. Easy manipulation of the hook-arm is made possible by the convenient hand-grip on the arm itself.

After the load is hooked, the operator simply pulls backward, and the load slides easily onto the balanced tilting carrier plate. The leverage principle employed reduces the operator's effort to a minimum. To discharge the load, a slight push forward with the hook-arm overbalances the carrier plate and permits the load to slide gently to the floor.

The tilting carrier plate is constructed of parallel steel plates, and is balanced so that the forward movement of the hook-arm places it in loading position. In pulling position, or when a load is being hauled, the carrier plate is automatically tilted back off the floor. The device is of sturdy, all-steel welded construction. It is equipped with one swivel and two stationary casters, either steel or rubber.



The illustration shows Henry A. Teichtmann, the truck's inventor, demonstrating one of the many applications of the versatile unit. Descriptive literature is obtainable upon request.

Teichtmann Industries, Dept. BB
714 W. Wisconsin Ave.
Milwaukee 1, Wis.

DIAMOND TOOLS

For All Industrial Uses



**I LIKE CLIPPER TOOLS
THEY'RE DEPENDABLE**

CLIPPER assures customer satisfaction by putting the emphasis on quality. Every CLIPPER tool is guaranteed to give maximum service. It is our policy to cooperate closely with customers to help them get the most out of their diamond tools.

CLIPPER welcomes the opportunity to advise and assist you on your diamond tool problems.

Representatives in Most Important Cities

CLIPPER DIAMOND TOOL CO., INC.

21-D W. 46 ST. N.Y. 19



LUMA Combination Etchtool & Demagnetizer



Etches, Demagnetizes, Anneals and Solders. Will permanently mark hardest steel with ease of a fountain pen. Etch and Demagnetize in same operation or separately. Write for details.

LUMA ELECTRIC EQPT. CO.
P. O. Box 132-H Toledo 1, Ohio

**OUR
EFFICIENT
TOOL DESIGNING**

*means
better production
at a lower cost*

Efficient tool designing in post-war's competitive production is a "must". Our experience guarantees you tools — designed for economy of operation, resulting in your increased production at lower costs.

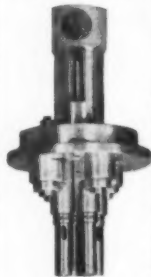
COLUMBUS DIE TOOL

and Machine Co.

930 CLEVELAND AVE., COLUMBUS 9 OHIO

SELLEW

**CLUSTER ADJUSTABLE
FULL BALL BEARING
DRILL HEAD**



This type of adjustable head can drill holes in circular, straight line or staggered formation. The minimum circle obtainable with this No. 1 AC size is 2", maximum circle obtainable 7". When head is furnished with drill chucks, largest size drill, $\frac{3}{8}$ ", when furnished with taper holes in the spindles, largest drill is $\frac{9}{16}$ ".

Heads of this type are made in larger sizes with No. 2 and No. 3 M.T. Holes in the spindles.

We also design and build special drill heads, and drilling machines to customer's specifications.

SELLEW MACHINE TOOL CO.
(INC. 1910) — PAWTUCKET, R. I.

BELLOWS IMPACT ASSEMBLY PRESS

The Bellows Company has announced the manufacture of the Bellows Impact Press, an air operated unit of the medium-heavy type for assembling hanging, marking, forming, riveting and similar fabrications.



This new Bellows Impact Press uses an integral valve air motor for the compression of a heavy die type spring from which the ram force is derived. The downstroke of the air motor is used to compress the heavy die type spring which rests directly on the ram and is held in place by a spring loaded trigger mechanism. The compression of the spring, from a few ounces pressure to the maximum of 6500 p.s.i., is quickly obtained by adjusting lock nuts on the threaded portion of the air motor piston rod. The spring is released automatically when the piston rod is fully extended. The return stroke of the double acting air motor returns the ram to starting position, where it is automatically locked in position by the trigger mechanism.

The steel ram shaft has a maximum clearance of $13 \frac{7}{16}$ " and a maximum movement of $1 \frac{1}{4}$ " with a vertical adjustment of 12". The throat clearance

from the center of the ram is 7". Base width of the new press is 10". Lugs are provided in the base for bench mounting.

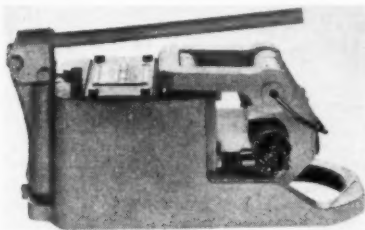
The Impact Press requires only one air line connection for operation. It can be equipped with electrically or manually operated controls and can be operated either by hand or foot.

For complete information, write:

The Bellows Co., Dept. BB
222 W. Market St.
Akron, Ohio

PORTABLE CABLE CUTTER HAS 1½" CAPACITY

A new-model portable wire rope cutter with a maximum capacity of 1½" wire rope is introduced by Pell Cable Cutter Co. The new Hydrashear Model LC, weighs only 70 pounds and can be operated in any position. Of all-steel construction, the Hydrashear is manually operated, entirely self-contained, and does not have to be anchored when in use. It cuts through the application of hydraulic pressure.

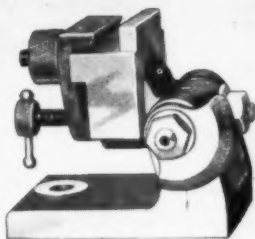


The Hydrashear is especially adaptable for use in oil fields, the lumbering industry and marine service; its portability is useful to any on-the-job operation where wire rope or cable is used. This improved cutter speeds up cable repair emergencies, and shortens equipment lay-ups.

The unit is 16" long, 6" wide, and 8½" high. It cuts wire rope without deformation quickly and safely. For complete details, write the manufacturer:

Pell Cable Cutter Co., Dept. BB
55 New Montgomery St.
San Francisco 5, Calif.

UNIVERSAL ANGLE VISE



Universal Angle-Style "A"

Designed for small work; held fast by a fulcrum clamp. Work can be locked in any desired combination of angles. Especially adapted to hold tungsten carbide tools for reconditioning.

CAPACITY—Holds work up to 1¼" square, any length.
HEIGHT—4½". **JAW** width 2¾". **BASE** dimensions—3" x 4½".
WEIGHT—7 pounds net.

MONTGOMERY
Machine & Tool Accessories
53 Park Place New York City

famous **FERRACUTE** **ACCURACY and** **RUGGEDNESS** *in a small, inclinable* **BENCH PRESS**



Model C-31½ has a 6-ton capacity and is catalogued at a speed of 170 to 190 strokes per minute. It is so strongly built, in the Ferracute tradition, that it is capable of sustaining considerably higher speeds under strain of continuous operation and gives an accuracy that is unusual in a bench press. Write for details.



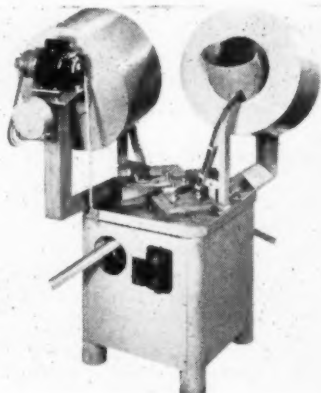
MACHINE CO.
BRIDGETON, N. J.

NEW THREAD MILLING MACHINE ATTAINS OUTSTANDING PRODUCTION

The D. H. Prutton Machinery & Tool Co., Cleveland manufacturers of the "Tapmaster," announce a new rotary thread rolling machine, designated as the Rollmaster.

This new unit attains production rates which surpass those attained by other methods of threading, ribbing, knurling, marking, etc., according to the designers, since no motion is lost by reciprocating movements. Bolts and studs of various descriptions up to $\frac{1}{4}$ " in diameter can be run through any of the above operations at a rate between 15,000 and 20,000 pieces per hour. Compact and rugged, the Rollmaster can be adapted to individual rolling specifications. Write for further information to:

D. H. Prutton Machinery & Tool Co.
5295 W. 130th St., Dept. BB
Cleveland, Ohio



TRANSFORMER WITH EXPANSION TANK

The Eisler Engineering Co., Inc., specializing in the manufacture of all types of transformers up to 400 KVA and 15,000 volts, has introduced an oil-insulated, self-cooled type transformer,

provided with an expansion tank, the purpose of which is to maintain the transformer oil as long as possible in good condition.

In general, this transformer is built by mounting one tank directly on the cover of one standard O.I.S.C. transformer of the proper size by means of structural steel supports. This expansion tank, also known as "oil conservator," is connected with the main tank of the transformer, about half filled with the transformer oil, and provided with a gauge to indicate the oil-level, a ventilating breather and necessary filler and clean-out holes (not visible in the illustration).

Air residues, vapor and condensed moisture are collected in the expansion tank thus leaving the insulating and cooling properties of the transformer oil, circulating through the coil windings, undamaged. These impurities can periodically be removed from the expansion tank.

For additional structural and performance details, write:

Eisler Engineering Co., Inc.
762 So. 13th St., Dept. BB
Newark 3, N. J.



KRYLON—A NEW TRANSPARENT PLASTIC COATING

A plastic spray, known as Krylon, which will furnish a rust-proof and corrosion-proof finish to practically any surface, has recently been developed. Krylon is a transparent plastic coating that is supplied in a self-contained compact sprayer. The solution is released simply by pressing the button on the top of the can, resulting in a fine spray of durable, colorless plastic material, forced out under pressure in such a way as to provide a clear, protective coating.

The coating dries in less than a minute, leaving a clear, satin finish that retains the flexibility of the material on which it has been applied. The coating resists discoloration at high temperatures, as well as water, alcohol, alkali, acids, mineral oils, grease, and chemical fumes.

In the metalworking industries, this new product opens up extensive economic possibilities. It can be the end of rust and corrosion of many products, due to the deterioration of many tools used in metalworking. Newly machined products sprayed with Krylon immediately after the machining operation will retain their finish through indefinite storage periods.

The Krylon protective coating may be removed any time by a solvent developed by the manufacturer. For complete information, write:

Foster & Kester Co., Dept. BB
Philadelphia 32, Pa.

60 YEARS' Manufacturing

Multiple Spindle Drilling and Tapping
Machines — Automatic Drilling and
Tapping Units — Multiple Spindle
Attachable Drill Heads — Hot and
Cold Swaging Machines — Hammering
Machines — Tools, Jigs & Fixtures
Contract Work — Special Machinery.

LANGELIER MANUFACTURING CO.
PROVIDENCE 7, RHODE ISLAND

SPELCHAKE MACHINERY CO.

118 MAC DONALD AVENUE
WINNIPEG, MANITOBA, CANADA

Desires contact to acquire agency or
representation of Machine Tools and
Equipment for Central Canada with all
facilities at Winnipeg.

Adjustable Collet Bushing Chuck—

provides an accurate method for mounting centerless armature shafts and similar parts in a lathe. Use in either head or tail spindle. The brass collets are adjustable for running or driving fits. Chucks supplied with 3 collets; 9/16", 5/8", and .637" capacity. Extra round collets, 1/4" to 1" by 16ths, \$1.10 each.



Chuck with No. 2
shank . . . \$9.45
Chuck with No. 3
shank . . . \$9.95
f.o.b. factory

SOUTH BEND

LATHE WORKS
426A E. Madison St.
South Bend 22, Indiana

Something New -

TRUE CENTERS TRANSFERRED INSTANTLY with Universal Transfer Punch

Centers and squares itself with fingertip pressure.

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Shop Hints

HOW TO MAKE AND USE A TWO-POSITION SPINDLE STOP

by Robert Mawson

When performing drill press operations, requiring two positive stopping positions, machine shops sometimes need a second machine spindle. For example, the job may be done on a three spindle machine in three or four operations. Under these conditions either the fourth operation will be transferred to another drill press or the position stop will be changed on the machine spindle.

Take a job which requires the drilling of a hole to a positive depth and then counterboring this hole to another positive depth, the work being performed in a single spindle machine. To do this job, either two different drill presses would be used; or the first operation could be done on the order lot, the position stop changed and the second operation performed.

The illustration shows a two position spindle stop which will solve many of these machining problems, virtually adding a spindle to a drill press.

The attachment is made with a cast iron body "A," in which is drilled a hole for a bolt "B" which is provided with a hexagon nut. The body is also drilled with another hole to suit the steel special bolt "C". In the center of the attachment is bored a hole of the proper size to suit the drill press spindle of the machine where the tool is to be used.

A hole is drilled and tapped for the steel knurled head adjusting stop "D". Opposite this stop, at the rear of the tool, is drilled and tapped a hole for the position stop locking screw "F". At the inner end of this screw is placed

a brass shoe "F" to prevent damage to the adjusting stop when the locking screw is tightened against its threads.

In the right hand side of the attachment is machined a slot to suit the position stop "G" in which has been drilled and reamed a hole so the stop can rotate on the bolt "C". The contact position of the stop is determined with the tool steel pin "H". The casting is also machined on its upper and lower faces. When the several machining operations have been performed on the attachment, the holes "B" and "C" with the position stop "G" are removed. The tool is now cut, with a machine saw, through the center of the bored hole. This process of parting the attachment leaves a space along the joint surface so that the tool can be fastened rigidly, with the two bolts, on the spindle of the drill press.

The several details which comprise the attachment are now reassembled into their proper positions so that the tool will be ready for service.

To use the two position attachment: The tool is first fastened onto the spindle of the drill press. The stop "D" is then adjusted and locked. The set screw "E" is in such a position that the distance between contact stop surfaces on "D" and "G" is the distance required on the operations of the piece being machined.

The drill press is now started in operation and the stop lever "G" is swung back in the attachment. With the attachment in this position the lower end of the screw "D" would be the position stop. After this operation has been

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performed, the spindle, and therefore the attachment, would be raised to the normal position. The second operation tool would then be placed in the collet of the machine. The stop lever "C" would then be swung down, in the position shown in the illustration, and the lower surface of the lever would be the position stop for this operation.

It can be seen with this self-contained attachment two positive positions can be determined for machining operations. Further, these positions can be easily changed or adjusted by moving the screw "D" and positive, accurate results are obtained. The attachment is a time saver, increases production and can well be considered an efficient production tool.

ALLIS-CHALMERS ORGANIZES MID-ATLANTIC REGION

Organization of a sixth region for the Allis-Chalmers general machinery division's field organization under William Arthur, formerly Philadelphia district office manager, has been announced by J. L. Singleton, vice-president and director of sales.

The new area, designated as the Mid-Atlantic region with headquarters in Philadelphia, will embrace territory now covered by Philadelphia, Wilkes-Barre, Baltimore, York, Richmond and Charleston offices. The York and Charleston offices, managed by G.E. Conn and R. L. Halsted, respectively, formerly branch offices, become district offices under the regional plan.

ASSOCIATION NAMES OFFICERS

Edgar A. Wilcox, of E. A. Wilcox Co., San Francisco, has been named president of the Manufacturers' Agents National Association. Regional vice-presidents include: Fred F. Patten, Stamford, Conn.; Art Thompson, Chicago; Lee R. Wallace, Los Angeles. W. S. Kirkpatrick is the executive treasurer. Executive secretary is P. Edwin Thomas. Headquarters are at 50 East 42nd Street, N. Y.

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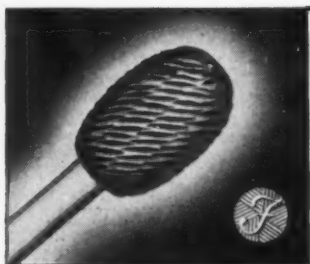
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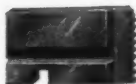
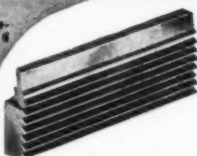
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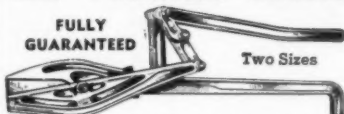
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Circular sawing of metals and 6 machines used are described. Detailed description of triple-chip segmental type saw blade, as well as new automatic blade sharpener. 16 pages. **The Motch & Merryweather Co., Dept. BB, Cleveland, Ohio.**

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Various machining operations can be performed in a single chucking of the work. Illustrations, description of machines, models 119 and 128, construction details, applications. 20 pages. **Automatic Drilling and Tapping Machines, Vertical Index, described in 4 pages. Illustrations, design and application data on a variety of jobs. Automatic Drilling and Tapping Machines, Central Column, 8 pages. Besides applications, case histories, cites performance and production results. Machines illustrated. All obtainable from Kingsbury Machine Tool Corp., Dept. BB, Keene, N. H.**

SHAPEMASTER ENGRAVER

Operational data, pictorial exposition of applications to the making of molds. Examples of work, specifications. Large illustration of machine. 6 pages. **Monarch Machine Tool Co., Dept. BB, Sidney, Ohio.**

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Complete description of various kinds of reamers. Sizes, dimensions, prices. Description of hollow mills: sizes, illustrations, dimensions, prices. 10 pages. **John M. Rogers Tool Corp., Dept. BB, Gloucester City, N. J.**

WIRE FORMING AND STRAIGHTENING DIES

Illustrated, gives typical applications of tungsten carbide in wire products industry. Case histories, sizes and types of carbide wire straightening dies. 4 pages. **Adamas Carbide Corp., 23rd St., Dept. BB, Long Island City 1, N. Y.**

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Universal Joints. Description, sizes and prices. Construction features are described. 4 pages. Flexible Couplings. The gear type is described. Stock sizes available, process, construction details. 4 pages. All available from American Gear & Mfg. Co., Dept. BB, Ogden Ave., Chicago 50, Ill.

LINE OF ELECTRIC MOTORS

Bulletin describes Multi-speed Gear-shift Drives and Pedestal Grinders and Polishing and Buffing Lathes. Construction details, schematic diagrams, advantages. Photos. 6 pages. The Lima Electric Motor Co., Dept. CK, Lima, O.

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Complete line of tool room or production millers, punch presses of various capacities are described. Attachments and accessories are listed. Specifications, prices, photos. 8 pages. Milling Machine. The B-12 machine, with accessories and attachments available is described. Price is featured prominently on cover. 4 pages. Both available from Diamond Machine Tool Co., Dept. BB, E. Olympic Blvd., Los Angeles, Cal.

FOUR SPINDLE AUTOMATICS

Models 475, 49 and 412 are described. Complete constructional details, specifications and special features. Photos are large, the machines are well presented. 12 pages. New Britain-Gridley Machine Div., The New Britain Machine Co., Dept. BB, New Britain, Conn.

SILICONES

Describes silicone resins, oils, greases, water repellents, and rubber. Applications listed. Charts and tables for reference. 30 pages. General Electric Co., Dept. BB, Pittsfield, Mass.

LUBRICATED VALVES

Complete catalog of various types of valves. Specifications, prices, illustrations, drawings. Straightway valves, semi-steel, and others Nordstrom Valve, Div. Rockwell Mfg. Co., Dept. BB, Pittsburgh 8, Penna.

WARNER-SWASEY COMPLETE LINE

Specifications, illustrations on ram, saddle and electro-cycle turret lathes; single and multiple spindle automatics; tapping machines and geared scroll chucks. 32 pages. Warner-Swasey Co., Dept. BB, Cleveland 15, Ohio.

GANG PUNCHING MACHINES

Machines designed for multiple punching of holes in steel sheets and plates. Bulletin describes mechanical features. Specifications for 12 machines. Verson Allsteel Press Co., 9300 S. Kenwood Ave., Dept. BB, Chicago 19, Ill.

PLATING EQUIPMENT

Automatic, semi-automatic, and special machines for plating and other sequence processing. Illustrations of equipment in operation. Plating data tables. 36 pages. The Meaker Co., S. 55 Ave., Dept. BB, Chicago 50, Ill.

QUICK SELECTION OF ELECTRIC MOTORS

Detailed specifications covering squirrel-cage induction motors. Application data, sizes, speed torque curves. Applications of gear motors, multi-speed induction motors. 12 pages. Allis-Chalmers Mfg. Co., Dept. BB, Milwaukee 1, Wis.

PRECISION SECOND OPERATION MACHINE

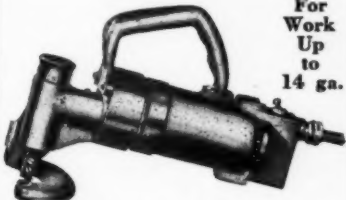
High speed precision lathe is well described. Full particulars on: tooling dimensions, floor plan, headstock spindle tooling, double cross slide tooling, shank turret tooling, etc. Well illustrated with photos and drawings. 18 pages. Hardinge Bros. Dept. BB, Elmira, N. Y.

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STEEL PLANT SERVES WEST

Quick, picture story of Ryerson's new plant in Emeryville, Cal. Illustrations include interior and exterior views of offices, plant, cutting and shipping facilities. Products are also discussed. Booklet on Cleveland area facilities also available. **Joseph T. Ryerson & Son, Inc.** Dept. BB, Emeryville, Cal.

HYDRAULIC PRESSES

Bulletin 285 Carries 37 photographs of various types of hydraulic presses ranging in capacity from 100 to 6000 tons for high speed production and accurate forming of sheet metal parts. 12 pages.

Bulletin 286 carries 21 photos of standard and custom built steam platen presses for use in fabricating of belting, brake lining, grinding wheels, linoleum, etc. 12 pages. **Baldwin Locomotive Works, Dept. BB, Eddystone, Pa.**

ROLLER HEAD SEAM WELDERS

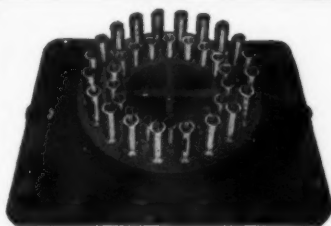
Among features listed are the use of a head completely guided and aligned by four sets of anti-friction rollers. Important points of design and operation are made plain. Photos, drawings, products. 8 pages. **Progressive Welder Co., 3050 E. Outer Drive, Dept. BB, Detroit 12, Mich.**

CATALOG OF CEMENTED CARBIDE TOOLS

Discusses solid inserts, replaceable flat tips, planer carbides, roll turning tools, face mills. New products include: piston grooving blades, feed finger pads, screwed-on pulley grooving tools. 70 pages. **Kennametal Inc., Dept. BB, Latrobe, Pa.**

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Model 200 High-pressure die casting machine can be furnished with a hot metal for casting zinc, tin or lead; or as cold chamber machine for aluminum, magnesium or brass. Specifications. 4 pages. **The Cleveland Automatic Machine Co., Dept. BB, Cincinnati 12, Ohio.**



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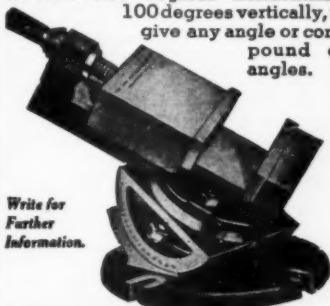
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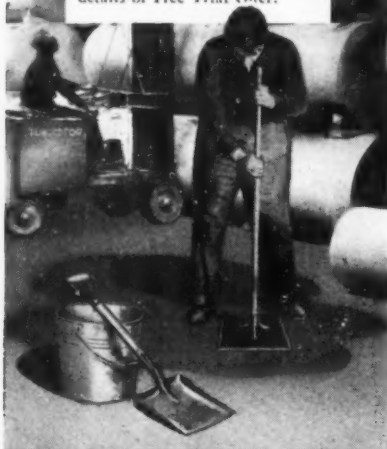
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CLUTCH CATALOG

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Heavy duty squirrel cage motors. Cut away and sectional drawings show details of welded frame construction, protective modern bearings and multi-layer insulation. Bulletin 1300-PRD-190 covers 2-pole. Bulletin 1300-PRD-189 covers 4 or more pole motors.

Bracket and pedestal-bearing types of synchronized motors. Application advantages and installation photos. Bulletin 1200-PRD-175 covers low-speed and bulletin 1100-PRD-181 covers high speed. Electric Machinery Mfg. Co., Dept. BB, Minneapolis, Minn.

DRAFTING MACHINES

New stainless steel drafting machines and equipment. Special features are illustrated, applications are listed. 6 pages. Emmert Mfg. Co., Dept. BB, Waynesboro 2, Penn.

FLUIDMOTION FORM DRESSING

Types of radii and angles dressers and wheel dressers are described. Fluidmotion wheel dressers generate wheel profiles in such a way that angles and radii flow into each other without sharp changes of directions. Illustrated with photos and diagrams. 8 pages. J. & S. Tool Co., Dept. BB, East Orange, N. J.

SOLDER TIN CONTENT INDICATOR

A checking instrument for quick analysis of solder quality. Illustrated with drawings and photos. 4 pages. Wheelco Instruments Co., Dept. BB, Harrison and Peoria Sts., Chicago 7, Ill.

GRINDING WITH OIL

Revamped, the booklet presents data on the application of oils to precision grinding projects. Sections include selecting proper oils and grinding wheels, wheel marking systems, standard chart of standard wheel shapes. D. A. Stuart Oil Co., Dept. BB, S. Troy St., Chicago 23, Ill.



DIELECTRIC HEATING

Westinghouse Electric Corp.
Pittsburgh 30, Pa.
40 minutes. 16 mm. sound film. In full color. Available without charge from the Film Section, Westinghouse Electric Corp., 511 Wood St., Box 868, Pittsburgh 30, Pa.

The principles and applications of Radio Frequency Heating in industry are explained in this motion picture filmed by Westinghouse. The subject is divided into two parts.

In Part One, the theory of induction heating is completely explained by the use of animation for the purpose of simplification. This explanation is followed by a series of practical sequences which illustrate the use of induction heating for soldering, brazing, annealing and hardening.

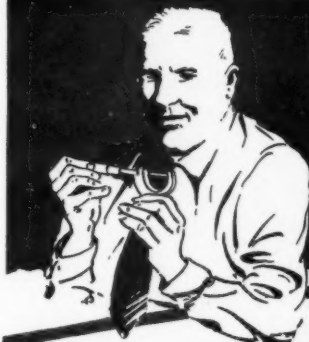
In a similar manner, the theory of dielectric heating is explained in Part Two. A series of industrial application stories follows, dealing with the preheating of plastic preforms, bonding of laminates and plywood, textile drying and twist setting, the curing and drying of rubber, and other applications.

GRINDING CARBIDE TOOLS

Norton Company
Publicity Dept.
Worcester 6, Mass.
26 minutes. 16 mm. Kodachrome with sound. Obtainable from the Norton Co.

The Norton Company, fully aware of the advances which have taken place in the field of grinding carbide tools since the first Norton film on this subject was made, have completed an entirely new motion picture incorporating

TODAY'S METAL CUTTING REQUIRES GOOD CUTTING FLUID



says . . .
"CHIP" WRIGHT

Material shortages and other unusual postwar conditions emphasize the need for sound cutting fluid practices. Uncontrollable changes in material quality call for cutting fluids with wide latitudes and broad tolerances. In such cases, the smart thing is to call on the broad, practical experience of established cutting oil people. They have the technical knowledge and facilities to apply their "know how" to your job.

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up-to-date grinding techniques and recommended practices.

The film is devoted entirely to explaining and demonstrating the methods of grinding carbide single-point tools and carbide face mills of the three conventional types, namely, brazed carbide tipped, inserted blade type with carbide tipped blades, and the inserted blade type with solid carbide blades.

This film is complete in itself, and may be shown alone, or may be used in conjunction with the film "The Diamond Wheel, Its Care and Use," reviewed in the Industrial Film section of the July issue of the MACHINE and TOOL BLUE BOOK, page 208. These Norton Films are available to industrial apprentice schools, foremen's groups, vocational schools—wherever machine shop practice is being taught. They have proven extremely helpful in explaining up-to-the-minute information in the modern field of carbides which shop men should know.

THE MILLER THAT USES ITS HEAD

Nichols-Morris Corp.

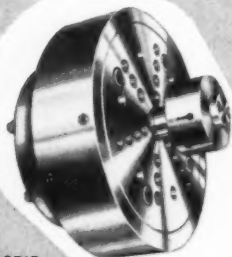
50 Church St.

New York 7, N. Y.

23 minutes. 16 mm. Kodachrome with sound. Obtainable without charge from Nichols-Morris Corp.

This is an educational film designed primarily to show tool engineers a few of the many applications of the hand miller, for rise-and-fall spindle heads. Unlike many technical films, this is not a "how-to-operate" film, but is an analysis of the hand miller from the tool engineer's and tool designer's viewpoint. It covers the ground from an assembly of the basic components of the machine to an explanation of the various attachments which can be added to improve the miller's versatility.

Various types of tooling and fixture designs, from simple stock fixtures to involved, completely automatic fixtures, such as one for planing a double-start helix on a fuel injector plunger, are shown. These latter examples have been taken from applications in the Nichols plant and those of customers.



SPEEDGRIP CHUCKS are used on turret and engine lathes, automatic chucking machines, vertical and horizontal multiple spindle boring machines, grinders, milling machines, gear shapers and hobbers, slotting machines, etc.

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- Higher Production
- Safer Operation

Precision built to produce parts that are parallel and concentric within .0002 . . . the SPEEDGRIP CHUCK is made in 6 sizes to accommodate work parts with bores ranging from $\frac{1}{2}$ " to 11" in diameter. Speed and ease of operation are possible by changing from one size extensible bushing to another . . . and in a matter of minutes, one parallel work spacing ring can be substituted for another.

SPEEDGRIP CHUCKS are new . . . yet proved superior in a number of leading plants. Write today for full details and informative folder. No obligation.

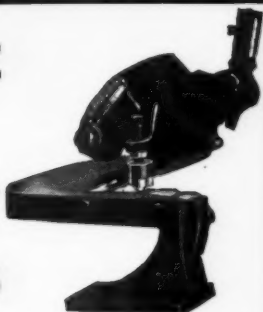
SALES ORGANIZATIONS:

Several good territories still available. Write or wire.

SPEEDGRIP CHUCK INC.

ELKHART, INDIANA

CUT ANY SHAPE BETTER with BEVERLY Throatless SHEARS



The No. B-3 BEVERLY Bench Type Shear with Ball Bearing Hold Down handles 3/16" or No. 10 gauge stainless steel. This sturdy shear weighs 58 lbs. and is equipped with H. C. H. Blades for heavy duty service.

Let us send Bulletins giving full details on the BEVERLY LINE—

THE BEVERLY SHEAR MFG. CO., 3005 W 110th Pl., Chicago 43, Ill.

For HIGH Torque

Specify

COMPACT DESIGN

HIGH TORQUE

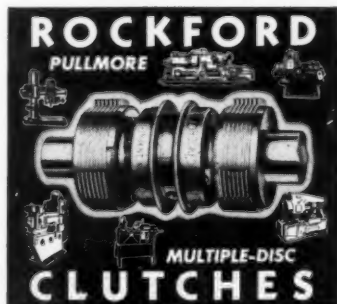
HIGH-RATIO LEVERS

POSITIVE NEUTRAL

PRECISION BUILT

LONG WEAR LIFE

EASY ADJUSTMENT



PULLMORE discs provide high capacity, and efficient lever design enables light engaging pressure. Discs are accurately made from special clutch-disc materials and are tested for flatness. Made in single and double types, for operation in oil or dry. PULLMORE clutches have capacities from 1 to 90 H.P. at 500 R.P.M. They handle loads of much greater capacity when operated at higher speeds.

Send for This Handy Bulletin

Shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.



ROCKFORD CLUTCH DIVISION

BORG-WARNER

★ 1309 Eighteenth Ave., Rockford, Illinois, U. S. A. ★

Pullmore Clutches are sold by Motor Chain Co., offices in principal cities

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

323

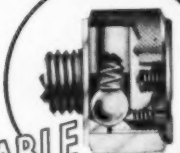
You Asked For It...

HERE IT IS!



"SET
YOUR
OWN"

ADJUSTABLE



Precision machined from properly
hardened materials to give
accurate life-time service.

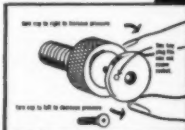
TORQUE THUMB SCREW

5 TO 50 POUNDS END PRESSURE...

In response to industry's demand for a Torque Thumb Screw that will not only hold during machining, but one which tool engineers can set themselves, to meet the requirements of many jobs, the Vlier Adjustable Torque Thumb Screw, with its wide range of 5 to 50 lbs. end pressure, presents the greatest boon to economical production ever offered. Setting the Vlier Adjustable Torque Thumb Screw is simple. Once set, the pressure will remain constant under all working conditions, assuring accurate holding tension, avoiding work distortion, preventing costly rejects and expensive fixture rework costs.

A trial will convince you the Vlier Adjustable Torque Thumb Screw is a "must" in your tooling operations.

Adjustment is made by
simply removing center
head screw, allowing
rotation of adjuster-cap,
which turns hex key,
regulating pressure.



A few choice territories available
for representatives as special dis-
tributors of the famous Vlier line.

Write today for detailed literature.



VLIER MANUFACTURING CO.

Manufacturers of Production and Tool Specialties
4552 BEVERLY BLVD., LOS ANGELES 4, CALIFORNIA

Appointments & Promotions

Hobart C. McDaniel has been appointed manager, Technical Press Service in the Public Relations Department of Westinghouse Electric Corp., Pittsburgh, Pa. McDaniel will be responsible for the Company's publicity in the technical and trade magazines. He will succeed Carl E. Nagel who has resigned to join McGraw-Hill Book Co., New York, as editor of mail sales books for the engineering and industrial fields.



Hobart C. McDaniel



Robert O. Blackford

Robert O. Blackford was recently named advertising and sales promotion manager of the Michigan Abrasive Co., Detroit.

Hannifin Corporation, 1101 S. Kilbourn Ave., Chicago, Ill., announces the appointment of the Jack J. Kolberg Company, 1305 Dexter Ave., Seattle 9, Washington, as its representative for the Hannifin line of hydraulic and pneumatic power and production equipment in the states of Washington, Oregon, and Idaho.

L. S. Cope has been made head of research and product engineering at Oliver Iron and Steel Corp., Pittsburgh according to a recent announcement by J. H. Lammert, vice president of the firm.

Detroit Broach Co. announces the appointment of **John Crampton**, 1114 Chester Ave., Cleveland 14, O., as representative.

Ray R. West has been named manager of sales of Minneapolis-Honeywell Regulator Co. products for industrial applications.

Llyod E. Slater has been appointed industry engineer in charge of food industry applications for measuring and controlling devices made by Brown Instrument Co. and Minneapolis-Honeywell Regulator Co., it was announced by officials of the industrial instrument division of Honeywell.

The Butterfield Division of Union Twist Drill Co., Derby Line, Vt., has appointed **W. V. Garfield** as district sales engineer to cover Connecticut and Western Massachusetts.

The appointment of **E. W. Chapman** as vice-president in charge of engineering has been announced by G. B. Tuthill, president of the Tuthill Pump Co., Chicago.

Dr. Frank Dana Carvin has been named head of the department of me-

chanical engineering at Illinois Institute of Technology.

Hufford Machine Works, Inc., Redondo Beach, Calif., manufacturers of hydraulic machinery and equipment, announce the appointment of **Walter George Wheeler** as chief engineer.



Walter Geo. Wheeler



Arthur L. Perkins

Hammond Machinery Builders, Inc., Kalamazoo 54, Mich. have announced the appointment of **Arthur L. Perkins**, White Plains, N. Y. as their new Eastern representative.

STANDARD CARBIDE TOOLS

Made in 2 types — "General Purpose" and "Steel"

Our "General Purpose" carbide tipped tools are used for most turning, facing and boring operations of cast aluminum and non-metallic materials. The "Steel" type are used for steel cutting.



Always tell us the material you are machining.

We will gladly quote you on your special carbide tools.

PROMPT DELIVERY



WRITE FOR LITERATURE



ACME TOOL COMPANY

71 West Broadway

New York 7, N. Y.

News of the INDUSTRY

APPOINTMENTS AND PROMOTIONS

30th ANNUAL METALS SHOW

A "Salute to Alloy Steel", in celebration of the seventy-five years of progress made in alloy steel, will be the central theme at the National Metal Congress and Exposition when the American Society for Metals holds its 30th annual convention in Philadelphia, October 25-29.

Principle features of this diamond jubilee for alloy steel will be: (1. A program of technical and historical papers about alloy steel. (2. Presenting of "Distinguished Service Awards" to individuals who have made outstanding contributions to the progress and development of alloy steels. (3. A dramatization of the part played by alloy steels in the history and development of our country. This third feature will include graphic evidence of the dependence of the American economy

on alloy steel as well as the progress of alloy steels in relation to the engineering, research and technology utilized in its development.

Three important committees, in each case composed of men who represent both the producing and consuming industries in alloy steel, have been chosen to work out the program of the celebration.

The Metal Congress and Exposition will provide thousands of visitors to the October Convention with interesting displays of many new developments in all phases of metallurgy. Many new products and processes will be shown for the first time during the Congress and Exposition, according to the ASM announcement.

EXHIBITORS

Acetogen Gas Company	A-1549
Acme Manufacturing Co.	618
Acme Steel Company	737
Acme Tool Company	
(See H. & H. Research)	
Air Reduction Sales Company	1845
Ajax Electric Company	645
Ajax Electrothermic Corp.	
(See Ajax Electric)	
Ajax Engineering Corp.	
(See Ajax Electric)	
Alan Wood Steel Co.	1809
Aldan Welding Supplies, Inc.	A-1567
Allison Company	705
Alloy Rods Company	345
Alvey-Ferguson Co.	1819
American Brake Shoe Co.	126
American Brass Co.	337
American Chain & Cable Co., Inc.	116
American Chemical Paint Co.	1654

SPACE

American Cladmetals Co.	124
American Gas Furnace Co.	
1509-(With AGA)	
American Emblem Co.	1729
American Gas Association	1301
Amer. Inst. of Bolt, Nut & Rivet	
Mfg. Assn.	1564
American Manganese Steel Co.	
(See Amer. Brake Shoe)	
American Metal Market Co.	1918
American Non-Gran Bronze Corp.	1767
American Smelting & Refining Co.	231
Anderson Oil Company, F. E.	1629
Arcos Corp.	144
Army Industrial & Recruiting Display	
	1357
Aronson Machine Company	1963
Arwood Precision Casting Corp.	1427
ASM -Philadelphia Chapter	A1554
Atkins & Company, E. C.	831

EXHIBITORS

SPACE

Audubon Wire Cloth Corp.	1545	Cincinnati Milling & Grinding Mach.	
Austenal Laboratories, Inc.	1428	Co.	1510
Auto Arc-Weld Mfg. Co.	1765	Cities Service Oil Co.	402
Automatic Temperature Control Co., Inc.	104	Cleveland Punch Shear Co.	1733
Automotive Industries (See Chilton Co.)		Clinton Machine Co.	1836
Baker & Co., Inc.	1853	Colonial Alloys Co.	1662
Baldwin Locomotive Wks.	1620	Commander Mfg. Co.	941
Bastian-Blessing Co.	1816	Commerce Pattern Foundry Machine Co.	(See Upton Electric)
Bath & Co., Cyril	1520	Continental Industrial Engineers, Inc.	145
Battelle Memorial Institute	1754	Crane Packing Co.	1530
Bausch & Lomb Optical Co.	310	Crystal Lake Grinders	1562
Bellis Heat Treating Co.	1356	Delaware Tool Steel Corp.	121
Bendix-Westinghouse Air Brake Co.	817	Delta File Works	1332
Black Drill Co.	656	deSanno & Son, A. P.	1362
Blakeslee & Co., G.S.	1762	Despatch Oven Company	1415-(With AGA)
Brown Instrument Co.	203		A1562
Brush Beryllium Co.	906	Detroit Mold Engineering Co.	1830
Bryant Heater Co.	1315-(With AGA)	Detroit Testing Machine Co.	208
Buehler Limited	441	Dietert Company	1909
Butler Cylinder Gas Co.	A1567	Distillation Products, Inc.	1815
By-Products Steel Co. (See Lukens Steel)		Diversey Corporation	844
Cambridge Wire Cloth Co.	1424	Donovan Company	416
Campbell Machine Div., Amer. Chain & Cable Co.	116	Dow Chemical Co.	
Carbomatic Corp.	1302	Dreis & Krump Mfg. Co.	
Carlin Company, Inc., J. A.	1657 & 1658	(See Edw. A. Lynch Mchy. Co.)	
Cherry Rivet Company	742	Drever Company	1653
Chilton Co.	1959	Drexell Institute of Technology	A1558

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- For precision milling and grinding angles, flats, tapers, hexagons and keyways.
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Extra Features - -

- Lever Action Collet Closer
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Hardened and precision ground 24 tooth index plate. 90° vertical setting angle. Precision angular type ball bearings with lateral takeup. Takes SC collets up to 1" capacity. Base 4 3/4" x 7 1/2". Height 5 1/2" to center. Weight 21 lbs.

WRITE for catalog for complete line showing many helpful and time-saving set-ups.

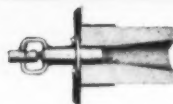
Representatives in your territory will demonstrate without obligation.



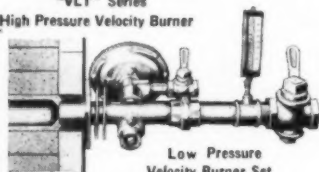
MATCO TOOL COMPANY 2830 - 36 WEST LAKE STREET
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Est. 1934 . . . Mfrs. complete line precision vises & wheel dressers

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"VLT" Series
High Pressure Velocity Burner



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**Economy
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Surface Combustion Automatic Proportioning Combustion Systems consist of two parts:—

1. An inspirator which mixes fuel and all air required in correct proportions over the entire operating range.
2. The burner or burners which facilitate complete combustion in properly sized combustion tunnel with rapid heat release.

Surface Combustion Automatic Proportioning Equipment is available for either of two methods of mixing—high pressure in which kinetic energy of the gas entrains the air—low pressure in which the kinetic energy of the air entrains the gas.

Entire combustion systems can be installed as an integral part of the furnace or appliance.

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EXHIBITORS

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Driver Company, Wilbur B.	1810
Dupont de Nemours & Co., E. I.	1665
East Shore Machine Products Co.	756
Ecco High Frequency Corp.	1467
Eclipse Fuel Engineering Co.	1410 (With AGA)
Edgecomb Steel Co.	109
Electric Furnace Co.	221
Electric Hotpack Co., Inc.	1763
Electro Alloys Division	(See Amer. Brake Shoe)
Elge Associates	1454
Engelhard, Inc., Charles	A1561
Eutectic Welding Alloys Corp.	1633
Fansteel Metallurgical Corp.	101
Federated Metals Division	(See Amer. Smelting & Ref.)
Ferner Company, R. Y.	1927
Finishing Publications, Inc.	603
Foot Mineral Co.	1554
Fostoria Pressed Steel Corp.	1558
Frankford Arsenal	(See Army Industrial & Recruit. Display)
Frontier Bronze Corp.	316
Gamma Scientific Co.	A1563
Gardner Publications	1345
Gas Appliance Service	1310-(With AGA)
Gehrich & Gehrich, Inc.	1307-(With AGA)
General Alloys Co.	204
General Controls Co.	1346
General Electric X-Ray Corp.	246
Goodrich Co., B. F.	638
Griffith-Raguse & Co., Inc.	1657
Gulf Oil Corp.	1616
H & H Research Co.	1909
Hamilton Manufacturing Co.	1576
Handy & Harman	132
Hanson-Van-Winkle-Munning Co.	607
Harnischfeger Corporation	1728
Harper Electric Furnace Corp.	605
Harvey Machine Co., Inc.	1449
Hauck Manufacturing Co.	1326
Hayes, Inc., C. I.	1557
Haynes Stellite Co.	(See Union Carbide & Carbon)
Heli-Coil Corp.	1330
Hobart Brothers Co.	944
Hones, Inc. Charles A.	1304-(With AGA)
Houghton & Co., E. F.	832
Hunter Spring Co.	1666
Illinois Testing Laboratories, Inc.	1431
Industrial Heating (Publ.)	(See Natl. Ind. Publ. Co.)
Industrial Press (Publ.)	1860
Industrial Publishing Co.	440
Industry & Welding (Publ.)	(See Indus. Publ. Co.)
International Nickel Co.	226
International Tin Research Institute	1325
Invincible Vacuum Cleaner Mfg. Co.	1566
Iron Age	410

EXHIBITORS

Jackson Buff Corp.	1710
Jackson Products	1933
Janney Cylinder Company	1450
Jarrell Ash Co.	1761
Jelliff Mfg. Corp. C. O.	1850
E. R. Joseph	A-1567

K-E Industries	1929
Kalamazoo Tank & Silo Co.	1462
Kanthal Co., A. B.	

(See C. O. Jelliff)

Keen Compressed Gas	A-1567
Kemp Mfg. Co., C. M.	1318 (With AGA)
Kent Company Inc.	1957
King, Andrew	411
Kropp Forge Company	848
Krouse Testing Machine Co.	133
Kux Machine Co.	908

Leeds & Northrup Company	1910
Lepel High Frequency Lab.	1749
Libert Machine Co.	

(See Edw. A. Lynch)

Lincoln Electric	1645
Lindberg Engineering Co.	344
Linde Air Products (See Union Carbide)	
Lipe Rollway Corp.	A-1546
Liquid Carbonic	1931
Lithium Co.	1409 (AGA)
Lobdell Co.	1856
Los Angeles Chamber of Commerce	1344
Los Angeles (Dept. of Water & Power)	

(See L. A. Chamber)

Lukens Steel Company	320
Lukenwald Division (See Lukens Steel)	
Lynch Machinery Co., Edw. A.	718

Machinery (Publication)

(See Industrial Press)

Machinery & Welder Corp.	1553
Magnaflux Corp.	723
Magnetic Analysis Corp.	1826
Mallory & Co., Inc. P. R.	637
Manganese Steel Forge Co.	

(See Audubon Wire Cloth)

Manhattan Rubber Division	1550
Materials & Methods (Publication)	107
McCracken & Sons, Inc., R. S.	A-1567
McGraw-Hill Publishing Co., Inc.	

(See Welding Engineer)

McKay Company	1833
Meehanite Metal Corp.	1610
Merrill Brothers, Inc.	A-1553
Metal & Thermit Corp.	426
Metal Finishing Service	1924
Metal Progress (Publication)	241
Metallizing Company of America	741
Metals Review (Publication)	

(See Metal Progress)

Metals Disintegrating Company, Inc.	937
Metlab Company	113
Michiana Company	1650
Michigan Steel Casting Co.	914

SPACE

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With STURTEVANT Permanently Accurate Torque Wrenches you can assemble to close tolerances of torque, can avoid over stressing and damaging strains. As easy to use as an ordinary socket wrench, Sturtevant Sensory (High Speed Production) Wrenches save assembly time while improving product quality.

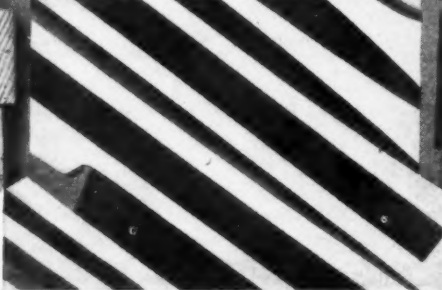
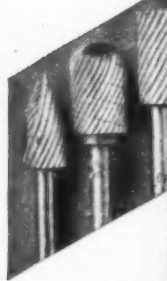
Write for Bulletin

SW-15



EXHIBITORS	SPACE		
Micro Metallic Corp.	1664	Pangborn Corp.	841
Midvale Company	238	Park Chemical Co.	340
Milne & Co., A.	1366	Parker-Kalon Corp.	1949
Milton Equipment Co.	1715	Partlow Corp.	1936
Minneapolis-Honeywell Regulator Co.		Penton Publishing Co.	1744
(See Brown Instrument)		Pereny Equipment Co.	1752
Morton Gregory Corp.		Philadelphia Electric Co.	1857
(See Nelson Stud Welding)		Phillips Manufacturing Co.	711
Motch & Merryweather Mach. Co.	642	Physicists Research Co.	125
National Bronze Aluminum Foundry	902	Plastic Metals Division	606
National Carbon		Poole, C. A.	1755
(See Union Carbide & Carbon)		Porter-McLeod Machine Co.	1921
National Diamond Hone & Wheel Co.	1848	Precision Shapes, Inc.	A-1557
National Industrial Publishing Co.	1533	Precision Welder & Machine Co.	624
National Lead Company	1915	Production Machine Co.	1327
National Radiator Co.		Pyrometer Instrument Co., Inc.	727
(See Plastic Metals Div.)		Quigley Company, Inc.	738
National Research Corp.	601	Radio Corporation of America	110
Navy Dept.—Bureau of Ordnance		Ransome Machine Company	1628
Naval Gun Factory		Raybestos-Manhattan, Inc.	
New Jersey Zinc	326	(See Manhattan Rubber)	
Niagara Blower Co.	A-1544	Reed Engineering Co.	1858-718
North American Phillips Co.	147	Reeves Pulley Company	1435
Northwestern Tool & Engineering Co.	1360	Reinhold Publishing Corp.	
Ohio Crankshaft Co.	304	(See Materials & Methods)	
Ohio Seamless Tube Co.	623	Revere Copper & Brass	702
Olsen Testing Machine Co.	1529	Reynolds Metals Company	1632
Optimus Equipment Co.	612	Richards Company, J. A.	628
Osborn Mfg. Co.	631	Riverside Metal Company	1758
Packer Machine Co.	1710	Rolock Inc.	1432
		Safety Clothing & Equipment Co.	837

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EXHIBITORS

Salkover Metal Processing	A-1559
Sargeant & Wilbar, Inc.	1537
Scherr Company, Inc., George	417
Schrader's Son, A.	1835
Sciaky Bros., Inc.	1619
Scott & Son, Inc., C. U.	408
Scoville Manufacturing Co.	950
Selas Corp. of America	1401 (AGA)
Sentry Company, The	413
Shell Oil Co., Inc.	1823
Simonds Saw & Steel Co.	1822
Simonski, Gilbert S.	1351
Snap-On Tools Corp.	1955
Socony-Vacuum Oil Co., Inc.	1720
South Bend Lathe Works	1866
Southern California Edison	(See LA Chamber)
Southern California Gas Co.	(See LA Chamber)
Spencer Turbine Company	217
Sperry Products, Inc.	139
Stearns-Rogers Manufacturing Co.	1321
Steel	(See Penton Publishing)
Stokes Machine Co., F. J.	1920
Stoody Company	938
Stuart Oil Company, Ltd., D.A.	211
Sun Oil Company	615
Superior Tube Company	1829
Surface Combustion Corp.	1416 (AGA)

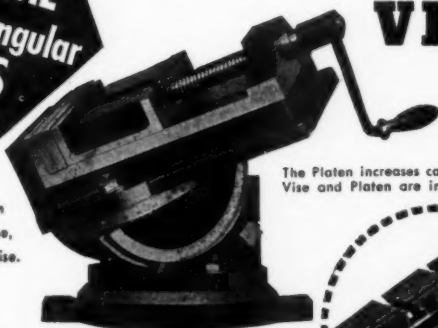
SPACE

Tabor Manufacturing Co.	A-1565
Taco West. Corp.	904
Tatnall-Young Testing Machine Corp.	(See Automatic Temp. Control)
Taylor-Winfield Corp.	1532
Technical Publishing Co.	(See Industrial Pub. Co.)
Tempil Corp.	309
Temple University	A-1550
Tennant Company, G.H.	1336
Texas Company	1563
Tide Water Associated Oil Co.	1436
Timken Roller Bearing Co.	446
Tinnerman Products	336
Torit Mfg. Co.	760
Torrington Mfg. Co.	632
Tri-Clover Machine Co.	1923
Udylite Corp.	214
Union Carbide & Carbon Co.	1602
U. S. Hoffman Machinery Corp.	838
U. S. Naval Eng. Experiment Station	(See Navy Dept.)
Upton Electric Furnace Div.	1525
Vacuum Equipment Div.	(See Distillation Products)
Vanadium Corp. of America	117
Vapor Blast Mfg. Co.	1967
Vascoloy-Ramet Corp.	(See Fansteel Met. Corp.)

SAVE TIME
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SET-UPS

Fully universal . . .
three swivels simplify the
setting of compound angles.
Parts interchangeable . . . can
be used as a plain flanged vise,
a swivel vise or multi-swivel vise.

Write for
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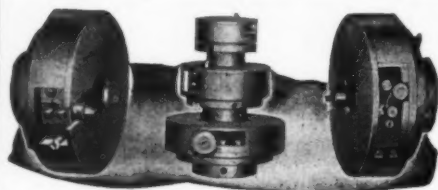
Multi-Swivel
VICE

The Platen increases capacity of the unit.
Vise and Platen are interchangeable.



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MUMMERT-DIXON FACING HEADS with Automatic Feed

One-way Tool Feed — 6, 9 and 12" sizes.

Two-way Tool Feed — 9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes.

Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

EXHIBITORS

Wall Chemical Div.

(See Liquid Carbonic)

Webb Corp.

(See Edw. A. Lynch Machine)

Welders Supply

A-1567

Welding Engineer (Publication)

1844

Wells, Inc., Martin

1455

Wells Manufacturing Co.

1661

Westinghouse Electric Corp.

806

Whistler & Son, Inc., S.B.

1502

Whiting Corp.

(See Edw. A. Lynch Machine)

Willys-Overland Motors, Inc.

1644

Wilson Mechanical Instrument Co.,

Inc. 116

CORRECTION

In the July issue appeared an article on Deep Drawing Aluminum. Through an oversight the story was not given a credit line. Due credit should be given to the Reynolds Metals Co. for making this material available to BLUE BOOK readers.

Don't miss the November issue of the MACHINE and TOOL BLUE BOOK containing the Annual Directory of manufacturers and their products.

SPACE

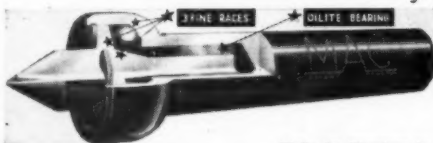
MACHINE TOOL SHIPMENTS DROP

Machine Tool shipments dropped during the month of July over June. Shipments during July stood at 79.9 as compared to 86.3 in June. New orders showed a corresponding drop, standing at 74.5 in July as against 83.4 in June. A bright note is a slight increase in foreign orders. July's foreign orders were 13.4 contrasted with 11.9 for June. However, both foreign and domestic orders are below last year's when domestic orders stood at 81.1 and foreign orders at 16.7. Average shipments for 1945-46-47 are considered as a 100% base.

WESTERN METAL CONGRESS

The sixth Western Metal Congress and Exposition will be held in Los Angeles at the Shrine Auditorium, April 11th through 15th, 1949. A program is being developed by the A.S.M. in cooperation with 20 other national technical societies that will, as in the past 5 Congresses, draw the production and technical personnel of western industry.

THE MAC REVOLVING CENTER



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THE WHITFIELD MFG. CO.,

The only revolving center that aligns itself with use. Adapt MAC for your external grinding, runs dead true at all times. Any type shanks made to your specifications, at a small additional cost, other than Morse Taper. MAC is made for wood and metal turning, revolving stops and straight shanks for turret lathes.

No. 2 to No. 4 Standard Morse Taper shank prices range from \$9.75 to \$35.00.

WASHINGTON C. H., OHIO

BRITAIN SHOWS HER LATEST MACHINE TOOLS

An ambitious and comprehensive machine tool exhibition was opened in London on August 26. The first to be held in Britain since 1934, it showed the products of more than 230 firms, some 25 per cent of them overseas manufacturers. The exhibition ran until September 11. Almost all the British machines exhibited were of postwar design or new developments and improvements of prewar types.

Among interesting machines displayed by British manufacturers for the first time were: a new type automatic contouring device using a profile template and accurate to .0005; a jig boring machine accurate to three-thousandths.

One interesting example of modern lathe design is a 6 $\frac{3}{8}$ inch center cutting lathe, having a bed six or seven feet long. It is capable of sliding feeds of 20 to 600 cuts per inch, and surfacing feeds 30 to 960 cuts per inch.

Another exhibit which aroused much interest is a multi-tool lathe in which several tools cut simultaneously on one workpiece. These machines have an automatic cycle, and tools index and cut automatically.

One historic exhibit which attracted attention is the Maudsley's wooden pulley and block shaper. (Maudsley was the inventor of the slide rest which revolutionized the lathe). Built in 1800 this machine made pulleys and blocks for the Royal Navy in Nelson's time and was in continuous use right up to 1944 when it produced pulleys and blocks for the modern navy. It is claimed to be the world's first mechanical machine tool.

Mr. George Strauss, Britain's Minister of Supply, when opening the exhibition, stated that it is now almost certain that in 1948 the total British output of new metalworking machine tools alone will exceed 30,000,000 pounds (\$120,000,000) worth; the output in 1935 was 6,500,000 pounds worth. Woodworking machines are expected to reach 5,000,000 pounds in valuation this year, as compared with an output of less than 1,000,000 pounds in 1935. The British Machine Tool industry is aiming at an export target of 20,400,000 pounds (\$81,600,000) per annum—some 60 per cent of its total production.

OBITUARIES

H. WILLIAM KOPF

Mr. Kopf died suddenly on August 13, 1948, at Detroit at the age of 66. He had been intimately connected with the machine tool industry for 46 years and was widely known and liked throughout the industry. He was the Detroit manager for Pratt & Whitney.

ELMER E. WHITE

Elmer E. White died on July 21, 1948 in Milwaukee at the age of 52. He represented Pratt & Whitney in the Milwaukee area for the last 21 years as sales engineer for Small Tools and Gages.

WILBUR C. MASSOW

Wilbur C. Massow, assistant sales manager of Walsh Press and Die Company, division of American Gage and Machine Co., passed away on July 26th. He was 35 years old.

HANCHETT MAGNA-LOCK BUYS CHUCK DIVISION

On June 1, 1948 the Hanchett Magna-Lock Corp., purchased the entire Magnetic Chuck Division formerly operated by Hanchett Mfg. Co. The new company, although separate in capital structure, will work closely with Hanchett Mfg. Co., thus closely integrating the manufacture and sales of its products.

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plate. The piece is then nibbled. The template accurately guides the punch even though it is clamped above the work.

This new method, it is claimed, really saves time and money on short runs. For example, making a single cam formerly involved considerable preparation work. This method saves the making of expensive templates when nibbling out special orders, according to the manufacturer.

If, however, the production calls for more than a few pieces to be nibbled, the new idea may still be employed. With the light template, nibble out the first piece. This nibbled piece then can be used as a template for future nibbling.

If a hundred pieces or only a few pieces are to be nibbled, the process can be applied with satisfactory results in either event.

NEW NIBBLING TECHNIQUE

An interesting new nibbling technique has been developed by the Andrew C. Campbell Division of the American Chain & Cable Co., Inc., Bridgeport, Conn.

A thin metal (preferably a tern sheet) is placed on a drawing board and the design is drawn or scribed right on the metal.

This design is then cut out of the thin metal with a pair of scissors.

Then the template is blocked from sheet to be cut, a distance sufficient to allow stripper to pass between sheet and tem-

Don't miss the series on selling technique currently appearing in the **MACHINE** and **TOOL BLUE BOOK**. This month's articles are by E. J. Seifreat and A. L. Winsor on, **Who Influences Machine Tool Purchases**, and **How To Understand Your Customer**.

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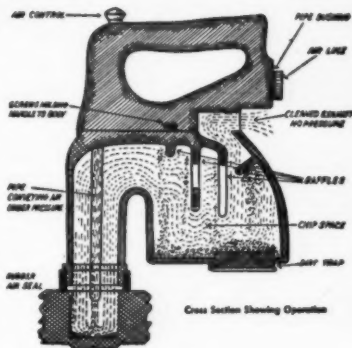
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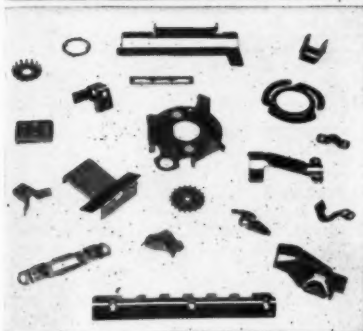
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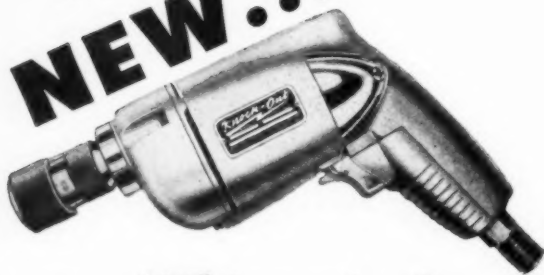
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G. E. QUESTIONS SILVER AS ELECTRICAL CONTACT MATERIAL

Silver, one of the widely used contact materials in electrical equipment, may actually be inferior to other materials for certain applications, according to B. W. Jones of the General Electric Co.'s Control Divisions.

Speaking at M.I.T., Mr. Jones described investigations into the factors involved in contact-material selection and application. The two most important factors in contact materials are thermal capacity and oxidation. Mr. Jones said, and silver

possesses the former characteristic in relatively low degree. The resultant tendency to vaporize and explode when interrupting large currents may overshadow the superior life possibilities which seem to be inherent in silver because of its low oxidation rate.

Oxidation is the important factor to consider when the contact materials will be used to make and break a moderate amount of power a large number of times, and thermal capacity is the factor that to a large degree determines the life of contacts used for making and breaking a very large amount of power a few times. These facts were determined by a series of three tests which encompassed a wide range of power circuits and operating conditions.

Four phenomena are generally observed when a power arc is established between two metal contacts: (1) a small spot on the

metal contacts reaches the boiling point and some material escapes as vapor; (2) oxidation of many contact metals under these temperatures; (3) the arc causes the gases, occluded in the metal near the contacting surfaces, to explode and loosen small particles, and, (4) the hammer action of the contacts opening and closing break off the particles loosened by explosion or oxidation.

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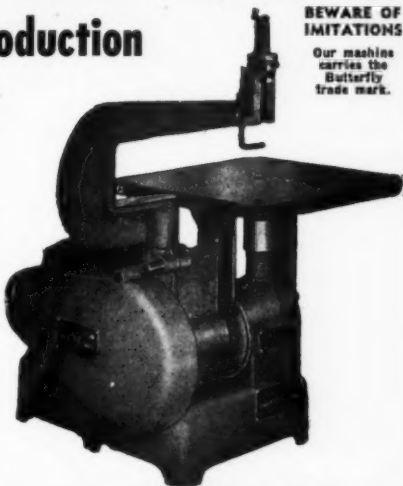
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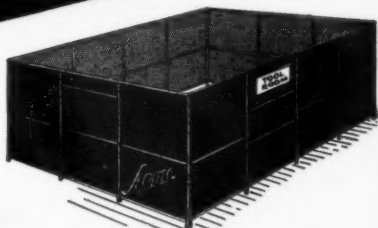
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KING COTTON GOES MECHANICAL

Cotton—bulwark of the \$10 billion textile industry—is now in the throes of a dual mechanization that bids fair to revolutionize the entire production cycle of this staple.

"A host of new machinery, ranging from cotton pickers to intricate and automatic thread spinners are being manufactured and installed at record rates," declares Arthur B. Studley, sales executive of SKF Industries, Inc., and chairman of the American Society of Mechanical Engineers' textile division. With textile

strong on labor-saving, less maintenance and longer wear," the SKF official says. He reports that while only 8,400 gins are in operation today, compared with 12,000 in 1938, the lesser number meets all demands due to more efficient cleaning and drying processes. Statistics also show a seven-to-ten-fold increase in use of spindle type pickers.

Don't miss the November issue of the **MACHINE** and **TOOL BLUE BOOK** containing the Annual Directory of manufacturers and their products.

earnings and purchases at an all-time high and wage levels and living conditions at a point where the industry can compete for skilled workers with most others, King Cotton is "more securely enthroned" than ever before, Studley says.

Textile mills in 1947 spent in excess of \$400,000,000 for new plants and equipment, he says. Furthermore, expenditures are continuing at a high rate this year and at least one-fifth of the nation's textile firms expect to spend even more in 1949—a great part of which is earmarked for cotton mills and machinery since cotton accounts for more than three-fourths of the poundage of all textile fibers used in the U. S.

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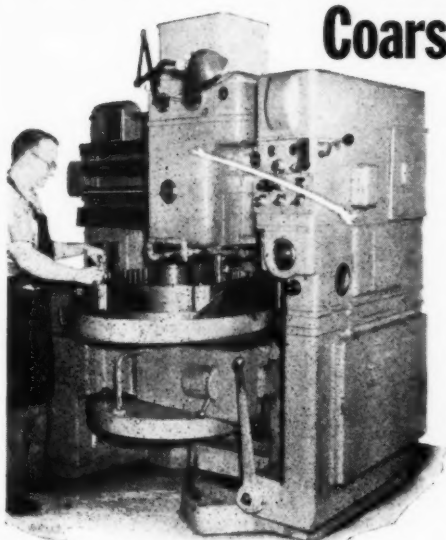
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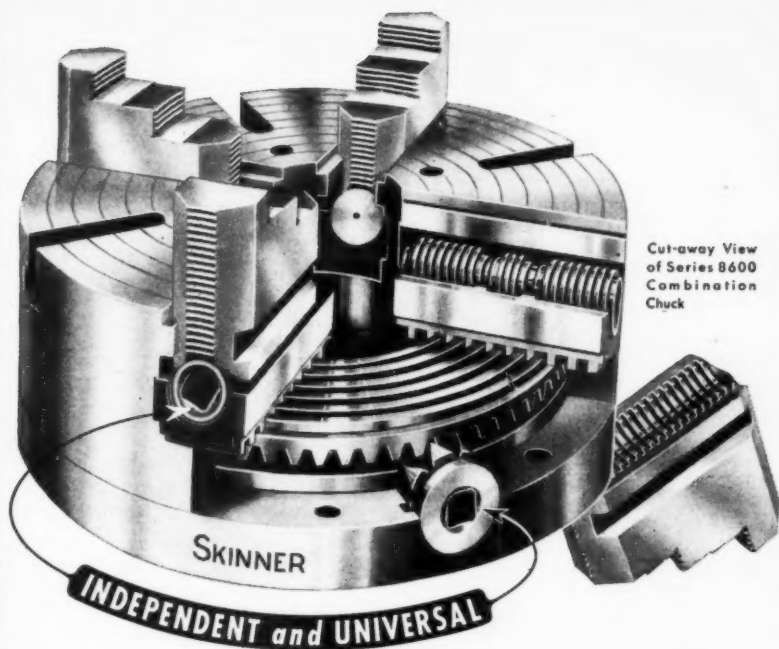
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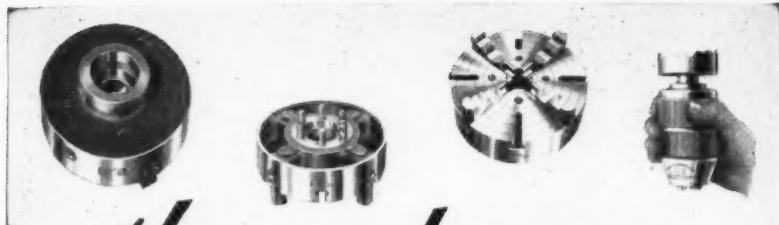
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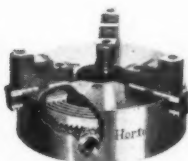
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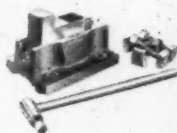
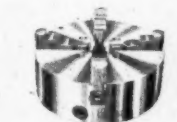
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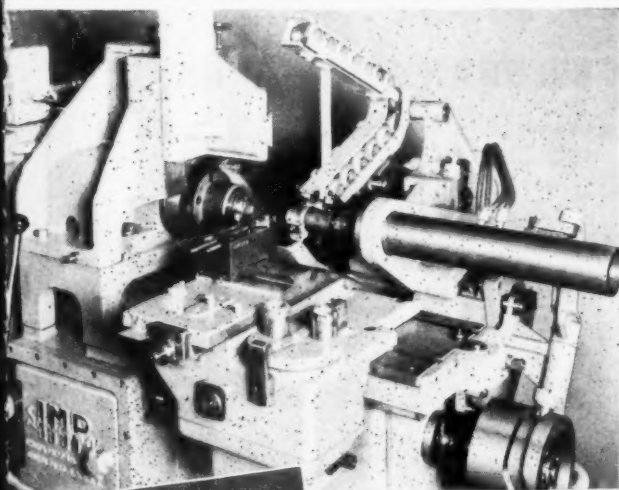


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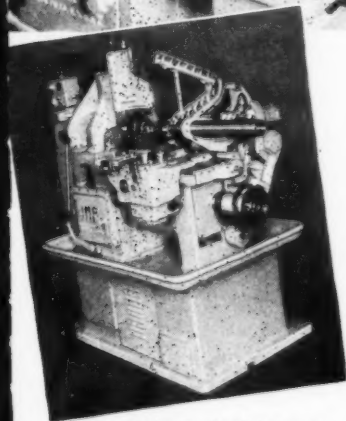
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The close-up view of the machine shows the cams (covers removed) which operate the automatic loader and which assure perfect timing of all movements.



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4	3.57
5	3.57
6	3.57
7	3.27
8	3.27
9	3.27
10	3.15
11	3.15
12	3.15
13	2.91
14	2.91
15	2.91
16	2.79
17	2.79
18	2.70
19	2.61
20	2.61
21	2.61
22	2.49
23	2.43
24	2.43
25	2.34
26	2.34
27	2.34
28	2.16
29	2.16
30	2.16
31	1.98

No. by Gage	Our Price Per Doz. H. S. Steel
32	\$1.98
33	1.98
34	1.89
35	1.89
36	1.86
37	1.77
38	1.77
39	1.77
40	1.63
41	1.68
42	1.65
43	1.56
44	1.56
45	1.56
46	1.50
47	1.50
48	1.50
49	1.50
50	1.44
51	1.44
52	1.44
53	1.44
54	1.44
55	1.44
56	1.44
57	1.44
58	1.44
59	1.44
60	1.44
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5/64	1.86	2¾
3/32	1.92	2¾
7/64	2.04	2¾
1/8	2.16	3
9/64	2.34	3½
5/32	2.52	3¼
11/64	2.70	3¾
3/16	2.91	3½
13/64	3.15	3¾
7/32	3.45	3¾
15/64	3.75	3¾
1/4	4.05	4
17/64	4.50	4½
9/32	4.95	4¼
19/64	5.40	4¾
5/16	5.85	4½
21/64	6.45	4¾
11/32	7.05	4¾
23/64	7.65	4¾
3/8	8.25	5
25/64	9.00	5¾
13/32	9.75	5¼
27/64	10.50	5¾
7/16	11.25	5½
29/64	12.00	5¾
15/32	12.75	5¾
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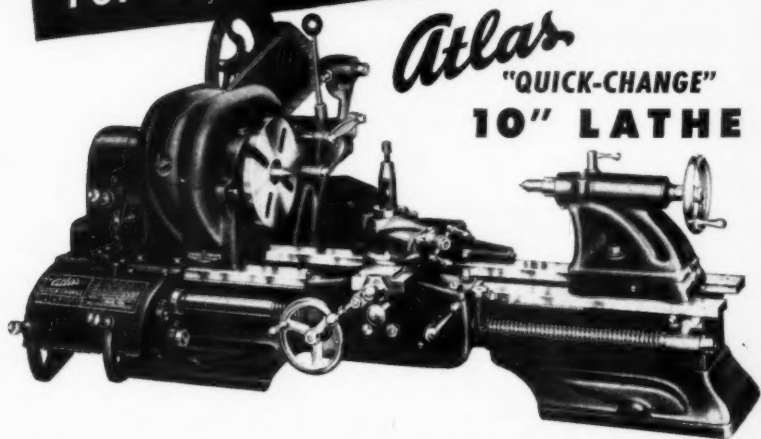
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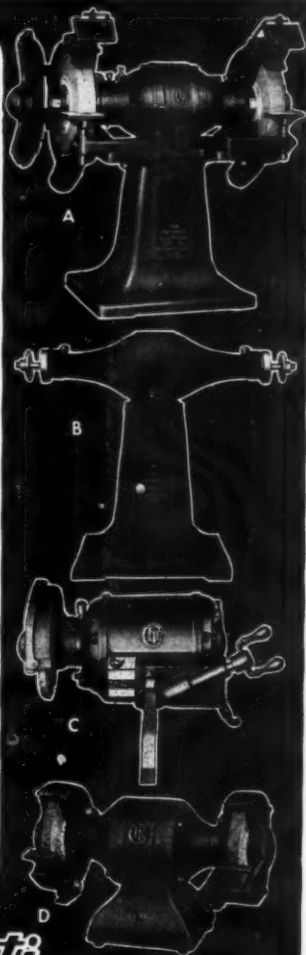
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2. Anchoring feature does not prevent easy removal of ALLENUT. Fastening can be made any number of times without damage either to ALLENUT or surrounding material.

3. 12-point (double hex) socket and sturdy Allen hex keys provide positive, non-slip wrenching action where ALLENUT is countersunk in hardened steel.

4. Can be pressed into soft metals or molded into plastics. When used as insert or bushing, possibility of thread stripping is eliminated. Firm holding is assured due to tight frictional lock produced by heat-treated Class 3 fit threads.

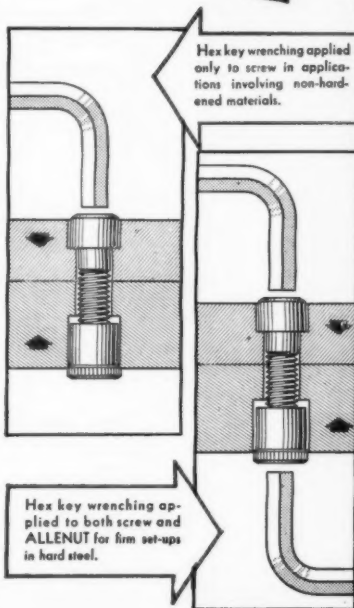
5. ALLENUTS can be set flush with or below containing parts resulting in streamlined contours without projections. Internal socket contributes to compact designs since no allowance is required for wrench clearance.

ALLENUTS of special heat-treated alloy steel are presently offered in sizes from No. 4 to $\frac{3}{8}$ " , either NC or NF threads. Sizes from $\frac{1}{16}$ " to 1" available soon. Order through your Allen industrial distributor.

Write for illustrated Bulletin N-51; also test samples of the new ALLENUT.



**Patent
Applied
For**



Hex key wrenching applied only to screw in applications involving non-hardened materials.

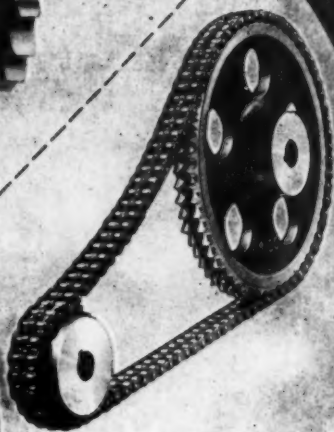
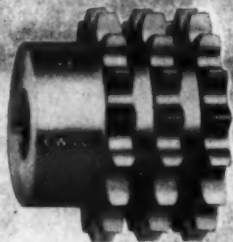
Hex key wrenching applied to both screw and ALLENUT for firm set-ups in hard steel.



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